

Recommended
Food Safe Best Practices
for
Producing Maple Syrup
In
New York State

NYS MAPLE PRODUCERS' ASSOCIATION
AND
THE NYS DEPARTMENT OF AGRICULTURE

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A Historical Perspective of Maple Syrup Production

Earliest collection and processing of sap was primitive, involving collection of sap in wooden or bark containers placed to catch sap dripping from wounds made to the tree trunk. Water was evaporated from the sap by heating clay or metal vessels over an open fire or by placing hot stones into hollowed-out wooden logs holding the raw sap. This pioneer era maple syrup would have been extremely dark in color and contaminated with ash and grit. As one would expect, the quality of the “maple syrup” produced was a far cry from that produced in today’s modern sugarhouses.

In the 1800’s processing advancements included evaporators with flat pan and then continuous-flow pans. Ironically, these process enhancements raised the prospects of chemical contamination from metals such as lead (from lead solder). Then came galvanized buckets and pans and brass fittings, which can be a source of zinc. Today contamination can also arise from improper or excessive use of cleaning chemicals or defoaming agents, improperly maintained sap handling and storage systems so producers are well advised to be constantly vigilant in protecting the quality of pure maple syrup from the tree to the finished maple product.

Unlike the situation with some dairy and meat products, or fresh fruits and vegetables, harmful bacteria (e.g., *E. coli*, *Salmonella*, *Listeria*, etc.) are unable to survive in maple syrup due to its extensive boiling and high sugar content. However, yeasts and molds can colonize syrup if it is inadequately “finished” or if proper care is not used when packaging into containers.

With this background in mind, the purpose of this guide is to define best practices for maple sugaring operations in order to:

- maintain high standards of cleanliness in all phases of the process
- reduce to the lowest extent possible the potential for contamination of the finished product
- create the highest possible quality pure maple syrup.

We make a gourmet food product. It is critical that we maintain the highest standards of cleanliness and food safety.

Sugarbush Management

❖ Site Selection & General Management

When developing a new sugar-bush, care should be taken to identify properly and clean up any possible sources of toxic waste or pollution in or adjacent to the site. Previous livestock pasturage is not a problem. Roadside tree use should only be in areas where pesticides and other chemicals are not in use. Tapping of a cemetery, golf course, residential trees, or similar environment where lawn pesticides are used could result in contamination and should not be part of a commercial syrup production system.

Synthetic fertilizers and pesticides are rarely if ever applied to sugar maple stands: any use should be in full compliance with the label.

Sugarhouse Design & Construction

❖ Basic Design

Sugarhouses should be constructed to exclude bats, birds, rodents, insects, and other pests to avoid contamination of the finished product. Walls and ceiling should be made of materials that allow them to be kept free of cobwebs and dirt, and floors should be designed for hosing down. Rough interior walls and ceilings (such as unvarnished shiplap) are acceptable only if hoods are on pans and tanks have covers. LEDs are a preferable style light bulb, but if older styles are used they should be protected with shields to avoid contamination of sap/syrup if breakage occurs.

All sugarhouse equipment that comes in contact with syrup should be lead-free stainless steel or other food-grade materials. Don't use galvanized or brass plumbing materials for sap transfer. Food preparation surfaces should be of impermeable, food-safe materials that can be cleaned and sterilized as needed to eliminate microbial growth.

❖ Safety Features

The NYS fire code should be referred to for recommended safety features. (See appendix B for the section of the NY fire code pertaining to

sugarhouses). These features include fire extinguishers, a 9-1-1 emergency wall sign and other inexpensive safety measures.

A hand washing sink should be provided. If no sink is available, you should build your own portable handwashing station.

❖ Chemical storage

A closed storage cabinet - preferably metal - should be used to store cleaning solutions & caustic chemicals used on the evaporator and reverse osmosis equipment. When using chemical cleaners, always obtain a copy of the label and follow the directions. A copy of the Material Safety Data Sheet (MSDS) for that material should be in or near the cabinet.

Only chemicals used in the maintenance of the sap processing equipment should be stored in the sugarhouse (e.g. NaCl, peroxide, bleach, citric acid, cleaners). Pesticides, poisons, petroleum products are example of items that should never be in the rooms used for sap processing or syrup finishing. Use appropriate personal protective equipment when using chemicals. Consider having disposable safety glasses, chemical safe gloves, and a disposable respirator available. An eye wash station is advisable.

❖ Sugarhouse Water

A potable water source that is periodically tested for continued potability is essential due to the need for safe water for cleaning equipment and for maintaining personal hygiene. Municipal water test reports can be obtained from the operator by all users of that water. Wells, whether drilled or dug, should be tested at least yearly by a capable laboratory to ensure that water used is free of microbial (*E. coli* and other coliform bacteria), physical, or chemical contamination and only used if it meets standards for safe drinking water. Water available as permeate from an RO unit or distilled water from a properly constructed and maintained pre-heater system both are excellent for cleaning.

A properly installed sink should be available for cleaning small pieces of equipment, ideally with both hot and cold water faucets.

Sap Collection

❖ Spout Types

Spouts must be made of food grade materials.

❖ Tapping Guidelines

There are guidelines for the size of trees to tap and the number of taps suggested per tree but these guidelines are designed to keep the best production levels and are in no way related to tree health or food safety.

❖ Buckets & Bags

Buckets of various materials have long been a mainstay of sap collection systems. Modern buckets are made of aluminum or plastic. There are also plastic sap bags. Plastic pails should have the HDPE or number 2 symbol. Never use a container that has ever held a hazardous material or is non-food grade to collect or store sap. Don't use buckets that have been painted inside as it is unlikely that the paints used were food grade paint. Don't reuse containers that have previously been used to store potential allergens such as dairy, nuts or nut oils.

Buckets with lead in soldered joints or galvanized buckets should not be used as this metal can leach into the sap.

Buckets, gathering pails and collecting tanks should be cleaned immediately after the end of the season using water or sanitizer. When sanitizers or detergents are used, buckets should be thoroughly rinsed to remove any residue. Buckets should be thoroughly dried before stacking and putting them away for the year. At the start of the next season, washing buckets with water and sanitizing solution is recommended followed by thorough rinsing.

❖ Tubing Systems

There are many opinions about techniques for cleaning tubing after a season. Research is ongoing on various techniques and their efficacy. Producers should remain up-to-date with the research and incorporate the recommendations from the current research. Development of maple flavors and colors depends in part on some level of natural fermentation occurring in

the sap collection and handling process. A completely sterile sap collection and handling system would step away from the traditional maple syrup flavors and quality. In light of this the following treatments of maple tubing systems are suggested.

1. Tubing systems may be drained to dry using mechanical vacuum systems or by removing spouts from the trees and letting them hang free to drain by gravity immediately after the syrup season. Cap afterwards to avoid insect invasion.
2. Tubing systems may be rinsed with water, then drained to dry using mechanical vacuum systems or by removing spouts from the trees and letting them hang free to drain by gravity immediately after the syrup season. Cap afterwards to avoid insect invasion.
3. Tubing systems may be rinsed with water plus bleach or food grade peroxide used according to label directions (see appendix C: Guidelines on use of bleach for sanitizing food equipment), then drained to dry using mechanical vacuum systems or by removing spouts from the trees and letting them hang free to drain by gravity immediately after the syrup season. In this case the first sap through the system of the next new sap season should be discarded for the first 2 to 8 hours, depending on the length of the tubing system, to flush any cleaner residue from the sap to be used. Cap afterwards to avoid insect invasion.
4. The tubing system may have the spouts removed and secured on the spout holders while leaving the tubing system full of sap. The sap then is allowed to ferment to ethanol and then to acetic acid as a natural cleaner. In this case the first sap through the system of the next new sap season should be discarded for the first 8 to 24 hours of sap flow, depending on the length of the tubing system, to flush all residue and prevent contamination of the sap to be used.

Sap Storage & Handling

Use only food grade material for all sap holding, piping, and transfer equipment and use only food grade lubricants for any equipment used in gathering or handling sap or syrup, or processing sap into syrup. (for example, quik-connect fittings, gear pumps, air diaphragm pumps, filter presses, vacuum pumps)

❖ **Filtering Sap and Tank Management**

Filtering sap will help maintain quality. Most commonly used are paper or cloth filters to remove larger foreign material from the sap. Some producers also employ small pore (5 μ) cartridge filters or food-grade diatomaceous earth filters or sand filters to reduce microbial content of sap. Whatever filter types are used, they should be cleaned, replaced, or sanitized frequently throughout the season to avoid bacterial contamination of fresh sap.

Cleaning storage tanks with water using a high pressure sprayer or a brush between runs will help maintain cleanliness. When sanitizing solutions are used follow product labels and rinse thoroughly to remove all residue.

Sap Processing

❖ **Reverse Osmosis**

Producers should refer to manufacturers' technical guide on proper installation, use, cleaning and storage of RO machines. Be sure to follow manufacturer guidelines for wash water neutralization. (See appendix D for NYS DEC ruling on RO machine wash water usage). Keep a daily cleaning record. See Appendix A, Figure 1 for a sample RO cleaning log.

❖ **Protective Gear and practices**

Making maple syrup means working with a thick, sticky, viscous liquid of temperatures that can inflict third degree burns. It is important to provide adequate protective gear for use when working with the hot liquid, and especially when moving containers of the hot liquid. Shoes should be closed, and be leather or some other non-porous material. Provide heat and liquid-resistant apron and gloves. Protective eyewear should be available as well. Always have a source of water nearby to allow quick rinse of a spill, and

keep a first aid kit in the sugarhouse.

❖ Evaporator

Many different brands and styles of maple evaporators are in use today. Evaporator should be stainless steel with welded or lead-free soldered pans. Lead in any component part is not acceptable.

❖ Syrup Filtration

Many different techniques are available for filtering finished syrup ranging from paper and cloth filters to canister or plate-type pressure filters. New cloth filters and paper pre-filters should be boiled in water alone (not in sap). Filters should never be cleaned with bleach, detergent, or other cleaners. "Musty" smelling filters, worn or moldy filters must never be used.

Filter presses should be thoroughly cleaned with water prior to use and between uses. Only food-grade filter-aid (diatomaceous earth) should be used. All components of a filter press that contact the syrup should be food-grade material.

❖ Syrup Finishing

A key aspect of maple syrup quality is that it is finished to the legally-required minimum density of 66° BRIX at 68° F. NYS regulation allows a range of 66 to 68.9. Ideal is to target 67 brix.

❖ Grading

Follow NYS regulation. (See appendix E for the NYS Maple Syrup Grade Regulation) Grading and syrup quality workshops are available through the Cornell Cooperative Extension, NAMSC, or IMSI and are strongly encouraged.

Packaging & Storage

❖ Bulk Containers

All drums should be examined inside using a bright light before use and thoroughly cleaned using steam or potable water. Bungs should be cleaned prior to use, replacing gaskets if necessary.

Regardless of what sort of container is used, best results are achieved by packing them hot (180° - 195 F.) and filling them completely. Tighten bung securely. Store bulk drums under refrigeration if possible or at least in a cool, dry place. Once a bulk drum is opened, it is best if the entire drum is packed at one time, as opening a drum can allow mold and yeast spores to enter and contaminate the cool syrup.

❖ Record Keeping for Bulk Storage

A simple log of every drum should be kept. Date produced, grade, weight (or volume), container id number should be the minimum of information written in the log. Mark each drum with the syrup grade, and the date produced/packed at a minimum. Label and keep at least one sample jar per drum packed as a record of the syrup characteristics. See Appendix A, Figures 2 and 3 for a sample drum and jar labels. When the barrel is used or sold, keep a record of disposition. See Appendix A, Figure 4 for a sample bulk syrup log. Keep logs for at least 3 years from the date of disposition.

❖ Retail packaging & storage

Retail containers should ideally be packed immediately prior to sale so that they have the maximum possible shelf life. Finish product should not go into previously used containers, use only retail containers that are new, undamaged, clean, dry, and free of foreign matter, and pack them hot (i.e., between 180° to 195° F.). Grade A maple syrup means maple syrup that is not fermented, is not turbid, and contains or has no objectionable odors, off-flavors or sediment. Syrup must be filtered prior to packaging. Ensure all weights and measures are true. Heavy glass containers should not be filled when they are cold. Turn containers on their sides for a few seconds. After hot packing, cool the sealed containers to room temperature as quickly as possible. Store in a cool, dark and low-humidity environment. Refrigerated storage is ideal.

❖ Labeling

Follow labeling regulations that specify product name, grade, container volume, and producer name. (See appendix F for NYS Labeling Guidelines)

There is no standard Best Use by date for maple syrup, the producer can set their own to meet the demands of their market.

❖ Record Keeping for Consumer Packaged Product

Assign a batch number when packaging any syrup. Batch number should be logged with drum number(s) or production date, and date packaged. Batch number should be on every retail package. It is a good idea to keep a small sample jar of the batch for a period of time greater than the anticipated product shelf life. Maintain a record where consumer package went for wholesale sales. (See appendix A figure 5 for template log) Keep those logs for at least 3 years from the date of disposition.

Sugarhouse Cleanliness

❖ Pest Management

Animals of any type are not welcome in a sugarhouse at any time. This includes domestic pets. Keeping them out is the responsibility of the sugarmaker and can be a challenge. Fecal material (droppings) and hair/feathers are the primary potential contaminants for all animals.

Keep all doors and windows in good operating order and tightly closed. Install door sweeps under all doors to prevent rodent entry. Seal all cracks and crevices around wires pipes and vents to deter pest movement into and within the building.

Always keep drums or other containers tightly closed and always wash down any surfaces that might contain syrup residue (e.g., counters, packaging systems, candy- making equipment, etc.).

Although mouse or rat poisons should not be used inside the sugarhouse because of the risk of contaminating syrup, it is acceptable to use them outside the sugarhouse in clearly marked bait stations. Bait stations should be tamper-resistant, and attached to some solid object to protect humans and pets from potential injury or death.

A variety of traps can be used to monitor presence of and eliminate mice or rats without use of poisons. Snap traps or live traps baited with peanut butter are particularly effective if placed along walls or in hidden areas where rodents travel and hide. Glue traps and flypaper can also be used but should be kept away from food preparation areas. Boric acid traps for ants are safe for use indoors.

Frequently empty all interior trash containers and do not allow other sources of food to remain outside of rodent-proof containers. Locate dumpsters and other trash containers as far as possible from the building and see that they are emptied regularly.

❖ **Pre-Season Sugarhouse Preparation**

Check all building surfaces - walls, ceiling, floors - and make sure all cobwebs, dust and dirt are removed. Now is a good time to wash those windows. Get the trash receptacles ready for use.

Wash all equipment with clean potable water to remove any dust, dirt or other foreign substances. Clean and rinse RO machines according to manufacturer's recommendations. Flush the pre-heater with potable water before using. Fill the evaporator with clean water, rinse thoroughly. Wipe down steam hoods inside and out.

❖ **Daily Sugarhouse Preparation**

A thorough cleaning of the sugarhouse at the end of each boiling day will help to deter pests and reduce the potential for syrup contamination. All working surfaces should be cleaned with water, sanitized and rinsed.

❖ **End-of-Season Sugarhouse Wrap-up**

Clean Everything!

Appendix A – Recordkeeping

Reverse Osmosis Membrane Health – procedures and recordkeeping

RO Owners - Is Your Membrane Healthy?

by Jean-François Goulet - LaPierre Equipment, edited by Helen Thomas

The life expectancy of an RO membrane is 10 to 12 years and can sometimes last even longer with good care, it can sometimes exceed that. It is important to follow a regular testing and maintenance regimen to give you that lifespan and, just as important, give you optimum daily performance.

There are two different types of cleaning cycles- permeate wash and chemical (soap) wash. It is also very important to conduct the membrane performance test that tells you when to use the soap wash.

RO Maintenance Recommended

Schedule is:

- Pre-season startup: **membrane performance test.**
- After each use: regular **permeate wash**, followed by a **membrane performance test.**
- When membrane performance test shows drop of 10-15%, conduct a **chemical wash.**

Membrane Performance test (also known as Pure Water Permeability Test or PWP)

This test should be done at the start of the season and then after every use, after you have done the regular 4-step permeate wash.

It is important to keep annual records of your P.W.P. test. See sample to right.

This is performed using permeate water, not sap!

1. Operate machine with permeate at concentration mode
2. Always test at the same pressure - adjust high pressure to 250 PSI or a little lower.
3. Adjust concentrate Flow-Meter at 3 GPM (+ or -)

4. Take the reading on the permeate flow-meter.

- Since permeate flow varies with temperature, a correction factor is necessary to do proper calculation of membrane performance. Use the table supplied by your manufacturer, or the table to the right.

- Divide today's corrected reading by the corrected reading of your pre-season test to get percent performance.

- When performance drops 10-15%, do a chemical soap wash. This should take your membrane back to nearly 100% performance.

Regular (daily) Permeate Cleaning:

Do this every time you run sap through the RO!

1. Right after you are done with sap concentration, flush with permeate to remove sugars, return "concentrate" to sap tank (approximately 5 minutes to remove the vast majority of sugars).
2. Do a 15 to 20-minute permeate rinse (send liquid to drain).
3. Do a close-loop warm water wash (wash-tank) every usage.
4. Do a final system flush with permeate.

Chemical (soap) cleaning:

This is only required when flow rate has lost 10%-15%. Note that some organic inspectors require the performance to have dropped by 15%, but it is usually advised to not let the performance drop by more than 10%. This process will get performance back close to its 100% value.

- Keep enough permeate to do a thorough rinse after the soap wash (a minimum of 300 gallons per membrane is recommended).

MAPLECREST FARMS PWP TEST 2016						
date	time	GPM	centigrade temperature	Corrected Reading	% performance	notes
2-10	8 pm	5.2	8	6.6	100	
2-11	9 pm	5.1	10	5.5	91.7	
2-12	9 pm	5.1	11	5.3	88.3	
2-19	10 pm	5.0	13	5	83.3	wash w soap
2-20	11 pm	5.2	8	5.9	98.3	

Sample of P.W.P. Test

Correction Factor Chart

Temp °C	Correction Factor	Temp °C	Correction Factor
0	0.672	13	1.000
1	0.685	14	1.028
2	0.719	15	1.055
3	0.742	16	1.084
4	0.766	17	1.112
5	0.790	18	1.142
6	0.816	19	1.170
7	0.842	20	1.200
8	0.866	21	1.229
9	0.893	22	1.259
10	0.919	23	1.289
11	0.946	24	1.319
12	0.973	25	1.350

Sample Correction Factor Chart

- Before soap wash, put on specific pre-filters.
- Don't forget to remove the soap pre-filters when done so that you don't process sap through them!
- Follow directions of soap manufacturer for amounts; be sure to follow EPA guidelines when disposing of wash water.

Figure 2 - template for a drum label

MapleView Farm Maple Road Anytown, NY	
Date: _____	Drum # _____
Grade: Golden	Amber Dark
Very Dark	Commercial
Tare weight: _____	Gross weight: _____
NET Weight: _____	
Hot Pack	Cold Pack
Notes: _____	

Be sure to use a permanent marker when filling out the label!

Figure 3 – template for a sample jar label

Date: _____
Drum #: _____
Farm Name

Figure 4 – template of a bulk batch log

Production Log For Mapleview Farm

Date Produced	Drum #	Grade	Weight	Notes	date used/sold	where used/sold

Figure 5 – template of retail batch log

Batch #: _____ Date: _____ Grade: _____ Volume: _____ Drums Used: _____		
container style	# packed	notes

Appendix B – NYS SUGARHOUSE ALTERNATE USE FIRE CODE

1. Section 1219.1 of Part 1219 of Title 19 of the Official Compilation of Codes, Rules and Regulations of the State of New York is amended to read as follows:

Section 1219.1 Uniform Fire Prevention and Building Code.

The Uniform Fire Prevention and Building Code (the “Uniform Code”) includes Part 1220 (Residential Construction), Part 1221 (Building Construction), Part 1222 (Plumbing Systems), Part 1223 (Mechanical Systems), Part 1224 (Fuel Gas Equipment and Systems), Part 1225 (Fire Prevention), Part 1226 (Property Maintenance), [and] Part 1227 (Existing Buildings), and Part 1228 (Sugarhouse Alternative Activity Provisions) of this Title and the publications incorporated by reference into those Parts.

2. Title 19 of the Official Compilation of Codes, Rules and Regulations of the State of New York is amended by adding a new Part 1228 to read as follows:

Part 1228 Sugarhouse Alternative Activity Provisions

Section 1228.1 Introduction

The provisions set forth in this Part are part of the Uniform Fire Prevention and Building Code (the “Uniform Code”). The provisions set forth in this Part are in addition to, and not in limitation of, the provisions set forth in Parts 1219, 1220, 1221, 1222, 1223, 1224, 1225, 1226, and 1227 of this Title.

Section 1228.2 Purpose.

This Part regulates alternative activities conducted in sugarhouses.

Section 1228.3 Applicability.

All references in this Part to the 2015 IBC, 2015 IEBC, 2015 IFC, and 2015 IPC shall be references to the specific publications as deemed to be amended by the provisions of the Uniform Code Supplement. Where this Part or other referenced sections of the Uniform Code specify different requirements, this Part shall be applicable.

Section 1228.4 Definitions.

Words and phrases used in this Part, but not defined by this section, shall have the meanings defined in the 2015 IFC, unless a different meaning is clearly required by the context.

- (a) **2015 IBC.** The publication entitled International Building Code (publication date: May 30, 2014, third printing) published by the International Code Council, Inc.

- (b) **2015 IEBC.** The publication entitled International Existing Building Code (publication date: May 30, 2014, fifth printing) published by the International Code Council, Inc.
- (c) **2015 IFC.** The publication entitled International Fire Code (publication date: May 30, 2014, third printing) published by the International Code Council, Inc.
- (d) **2015 IPC.** The publication entitled International Plumbing Code (publication date: May 30, 2014, third printing) published by the International Code Council, Inc.
- (e) **Alternative activity.** An activity, not normally conducted in a sugarhouse, which supports the maple product industry. Examples of such activities include product sampling, pancake breakfasts, educational tours and activities, and the marketing and sale of merchandise.
- (f) **Authority having jurisdiction.** The governmental unit or agency responsible for administration and enforcement of the Uniform Code.
- (g) **Approved.** Determined to be acceptable by the code enforcement official.
- (h) **Building.** Any structure used or intended for supporting or sheltering any use or occupancy. The term "building" shall not include a "temporary greenhouse".
- (i) **Code enforcement official.** The officer or duly authorized representative designated by the authority having jurisdiction with responsibilities for the administration and enforcement of the Uniform Code.
- (j) **Maple sap.** The sap or sweet water obtained by tapping a maple tree.
- (k) **Maple sugar.** Sugar made exclusively by the evaporation of pure maple syrup.
- (l) **Maple syrup.** Syrup made exclusively by the evaporation of pure maple sap.
- (m) **Permit.** A document issued by the authority having jurisdiction that authorizes an alternative activity to be conducted in a sugarhouse.
- (n) **Registered design professional.** An individual who is a Registered Architect (RA) in accordance with Article 147 of the New York State Education Law or a licensed Professional Engineer (PE) in accordance with Article 145 of the New York State Education Law.
- (o) **Sugarhouse.** A building used, in whole or in part, for the collection, storage, or processing of maple sap into maple syrup and/or maple sugar.
- (p) **Technically infeasible.** An alteration of a facility that has little likelihood of being accomplished because the existing structural conditions require the removal or alteration of a load-bearing member that is an essential part of the structural frame, or because other existing physical or site constraints prohibit modification or addition of elements, spaces or features which are in full and strict compliance with the minimum requirements for new construction and which are necessary to provide accessibility
- (q) **Temporary greenhouse.** Specialized agricultural equipment having a framework covered with demountable polyurethane materials or materials of polyurethane nature and lacking a permanent and continuous foundation, which is specifically designed, constructed and used for the culture and propagation of horticultural commodities. A "temporary greenhouse" may include, but is not limited to, the use of heating devices, water and electrical utilities, and supporting poles embedded in non-continuous concrete.
- (r) **Uniform Code.** The Uniform Fire Prevention and Building Code adopted pursuant to Article 18 of the Executive Law.

- (s) **Uniform Code Supplement.** The publication entitled 2016 Uniform Code Supplement published by the New York State Department of State.

Section 1228.5 Permit required.

An alternative activity shall not be conducted in a sugarhouse unless a permit has been issued by the authority having jurisdiction.

Section 1228.6 Duration of permit.

The duration of a permit shall not exceed 60 days, consecutive or otherwise, within a 12 month period. No alternative activity shall be conducted after daylight hours unless an approved lighting source is provided.

Section 1228.7 Application for permit.

The building owner or a duly authorized representative shall provide the authority having jurisdiction with the following information along with any other information that the authority having jurisdiction may reasonably request for the purpose of determining whether or not the sugarhouse and proposed alternative activity complies with the requirements of this Part:

- (a) the location of the sugarhouse;
- (b) a description of each proposed alternative activity;
- (c) the proposed occupant load determined in accordance with subdivision (d) of section 1228.14 of this Part;
- (d) the dates when each alternative activity will occur;

A fire safety plan and public safety plan shall be submitted with the application for a permit when required by section 1228.9 or subdivision (c) of section 1228.12 of this Part.

Section 1228.8 Inspection.

Prior to a permit being issued, the code enforcement official shall inspect the sugarhouse to determine if the building complies with the requirements of this Part. All adverse health and safety conditions and structural defects identified during the inspection that would jeopardize the health or safety of the occupants or the general public if an alternative activity were permitted shall be remedied prior to a permit being issued. The code enforcement official may require an evaluation of the building by a registered design professional when conditions warrant.

Repairs and alterations required to satisfy the health and safety provisions of this Part shall be made in accordance with Sections 502 through 505 of the 2015 IEBC. Additions made to an existing sugarhouse shall comply with this Part and Section 507 of the 2015 IEBC when such addition is for the sole purpose of accommodating a higher occupant load during an alternative activity.

The code enforcement official may conduct periodic inspections throughout the duration of a permit at his/her discretion. The provisions of this Part shall not be deemed to be a limitation on the administration and enforcement duties and powers of the authority having jurisdiction.

Inspections shall include but shall not be limited to:

- (a) the means of egress;
- (b) the separation of combustibles from ignition sources;
- (c) housekeeping;
- (d) storage;
- (e) the presence of dangerous or hazardous materials and conditions;

- (f) structural evaluation when conditions warrant;
- (g) evaluation of the existing and proposed floor loads;
- (h) exposed portions of mechanical, electrical, and plumbing systems;
- (i) portions of the sugarhouse and outside adjacent areas that must be secured from entry during the alternative activity;
- (j) sanitary conditions; and
- (k) the fire service features identified in section 1228.12 of this Part.

Section 1228.9 Fire safety plan and public safety plan.

Fire safety plans and public safety plans shall comply with the following:

- (a) **Fire safety plan.** A written fire safety plan in accordance with Section 404.2.2 of the 2015 IFC shall be submitted to the authority having jurisdiction as part of a permit application when the occupant load resulting from the alternative activities is 50 or more people or when required by subdivision (c) of section 1228.12 of this Part. Occupant load calculations shall be in accordance with subdivision (d) of section 1228.14 of this Part. Fire safety plans shall include the following information in addition to that required by Section 404.2.2 of the 2015 IFC:
 - (1) The premises identification pursuant to subdivision (b) of section 1228.12 of this Part;
 - (2) a site and floor plan indicating the seating capacity and arrangement, and the location and type of all heating systems; and
 - (3) the location of the approved emergency telephone.

A copy of the fire safety plan shall be provided to the fire watch personnel (when required) and shall be posted in a conspicuous place in each room for reference and review by occupants for the duration of the permit.
- (b) **Public safety plan.** When a public safety plan is required by other sections of this Part and fire watch personnel are required, such plan shall be provided to the fire watch personnel. Public safety plans shall be posted in a conspicuous place in each room for reference and review by the occupants for the duration of the permit.

Section 1228.10 Content and posting of a permit.

Permits shall be posted in a conspicuous location throughout the duration of the permit and shall at a minimum specify:

- (a) the name, address, and contact information of the owner of the sugarhouse or if the permit holder is not the owner, the name, address, and relevant contact information of the permit holder;
- (b) the premises identification pursuant to subdivision (b) of section 1228.12 of this Part;
- (c) each alternative activity authorized by this permit;
- (d) the occupant load of each room or space;
- (e) whether or not a fire safety plan or public safety plan is in place;
- (f) fire watch requirements (if any);
- (g) the dates of each alternative activity; and
- (h) any time limitations placed on each alternative activity.

Section 1228.11 Fire and safety precautions.

The following fire and safety precautions shall be observed during the duration of a permit.

- (a) **Open-flame decorative devices.** The use of open-flame decorative devices in the sugarhouse is prohibited.
- (b) **Cooking operations.**
 - (1) **Open-flame devices.** The use of flammable solids, butane, or other similar devices that do not pose an ignition hazard shall be permitted for cooking or producing maple syrup and/or maple sugar.
 - (2) **Outdoor cooking.** Outdoor cooking that produces sparks or grease vapors shall not be performed within 20 feet (6096 mm) of the sugarhouse.
- (c) **Open burning.** Open burning shall not be performed within 50 feet (15240 mm) of the sugarhouse.
- (d) **Smoking.** Smoking shall be prohibited in a sugarhouse during an alternative activity.
- (e) **Highly combustible materials.** The display or storage of highly combustible materials in main exit access aisles, corridors, or within 5 feet (1524 mm) of required entrances to exits and exterior exit doors is prohibited during an alternative activity. Highly combustible materials shall include but shall not be limited to flammable or combustible liquids, liquefied flammable gases, oxidizing materials, and pyroxylin plastics.
- (f) **Agricultural products.** The storage of hay, straw, seed cotton or similar agricultural products in the sugarhouse is prohibited during an alternative activity. Firewood used in the production of maple syrup and maple sugar shall not be considered an agricultural product. The storage of such agricultural products adjacent to the sugarhouse is prohibited unless a clear horizontal distance equal to the height of a pile is maintained between such storage and the sugarhouse. Storage shall be limited to stacks of 100 tons (91 metric tons) each. Stacks shall be separated by a minimum of 20 feet (6096 mm) of clear space except when approved by the code enforcement official.
- (g) **Decorative materials.** Decorative materials stored or displayed in a sugarhouse during an alternative activity shall comply with Sections 806 and 807 of the 2015 IFC. For the purpose of compliance with this subdivision, an alternative activity shall be classified in the occupancy that the alternative activity most nearly resembles, as determined by the code enforcement official.
- (h) **Fireworks, pyrotechnic displays, and sparkling devices.** Fireworks, pyrotechnic displays, and sparkling devices shall not be permitted in the sugarhouse or on the premises during an alternative activity.
- (i) **Secured Areas.** Rooms or areas that are not associated with an alternative activity and deemed a hazard by the code enforcement official shall be secured from entry by the public or otherwise marked with a sign indicating "KEEP OUT".
- (j) **Temporary greenhouse.** Alternative activities are prohibited in temporary greenhouses.

Section 1228.12 Fire service features.

The following fire service features shall be provided prior to a permit being issued.

- (a) **Emergency responder access.** Approved access shall be provided to the sugarhouse. Fire apparatus access roads, where provided, shall be in accordance with Section 503

and Appendix D of the 2015 IFC. Where fire apparatus access roads are not provided, a public safety plan for gatherings shall be provided if deemed necessary by the code enforcement official. Said plan shall be in accordance with Section 403.12.2 of the 2015 IFC.

- (b) **Premises identification.** When the sugarhouse has an address, it shall be identified in accordance with Section 505 of the 2015 IFC. When the sugarhouse does not have an address, the location of the structure shall be identified by monuments, signs, or other means visible from the public way and detailed directions to such structure provided to the authority having jurisdiction.
- (c) **Fire protection water supply.** An approved water supply capable of supplying the required fire flow for fire protection shall be provided to the sugarhouse in accordance with Section 507 of the 2015 IFC except when fire watch personnel in accordance with this section and Sections 403.12.1 through 403.12.1.2 of the 2015 IFC have been provided and a fire safety plan in accordance with Section 404.2.2 of the 2015 IFC has been provided.
- (d) **Carbon monoxide alarms.** Carbon monoxide alarms shall be installed in sugarhouses during an alternative activity. Carbon monoxide alarms shall be installed in accordance with the existing commercial building provisions of the 2015 IFC. Combination alarms shall not be allowed.
- (e) **Smoke alarms.** Smoke alarms shall be installed in an approved location on each floor and in accordance with Sections 907.2.11.3 and 907.2.11.4 of the 2015 IFC.
- (f) **Portable fire extinguishers.** Portable fire extinguishers shall be provided in the sugarhouse during an alternative activity as specified in Section 906 of the 2015 IFC.
- (g) **Emergency telephone service.** An approved, readily accessible emergency telephone shall be provided in an approved location. The premises identification pursuant to subdivision (b) of section 1228.12 of this Part and the telephone number of the fire department shall be posted adjacent to the telephone. Where a land line telephone is not installed, a mobile telephone shall be provided.

Section 1228.13 Equipment and appliances.

Equipment used in the sugarhouse shall comply with the following:

- (a) **General.** Equipment and appliances required by this Part or by any other provision of the Uniform Code shall be listed and labeled for the application for which it is intended.
- (b) **Cooking equipment and appliances.**
 - (1) **Installation and use.** Each cooking appliance that may be used during an alternative activity shall be installed and used in accordance with the manufacturer's instructions, the appliance's listing and labeling terms, and any other applicable provision of the Uniform Code.
 - (2) **Portable fire extinguishers for commercial cooking equipment.** Portable fire extinguishers shall be in accordance with Sections 904.12.5 through 904.12.5.5 of the 2015 IFC.
 - (3) **Type I hoods.** A type I hood shall be required in accordance with Section 609.2 of the 2015 IFC.

- (4) **Cooking appliances.** Portable cooking appliances that produce grease vapors are prohibited. Electric table top appliances shall be allowed when approved by the code enforcement official.
- (c) **Temporary heating equipment.**
 - (1) **Portable unvented heaters.** The use of portable, unvented fuel-fired heating equipment shall be prohibited.
 - (2) **Portable, electric space heaters.** Portable, electric space heaters shall comply with Sections 605.10.1 through 605.10.4 of the 2015 IFC.
- (d) **Liquefied petroleum-gases.** The storage, handling, installation, and use of liquefied petroleum gas (LP-gas) and LP-gas equipment and appliances shall comply with the applicable provisions of Chapter 61 of the 2015 IFC.
 - (1) **Portable LP-gas containers in buildings.** Portable LP-gas containers shall comply with Section 6103.2.1.1 of the 2015 IFC and shall only be allowed in buildings under the following situations:
 - (i) Portable LP-gas containers used for demonstrations and public exhibitions in accordance with Section 6103.2.1.5 of the 2015 IFC;
 - (ii) Portable LP-gas containers that supply approved self-contained torch assemblies or similar appliances in accordance with Section 6103.2.1.6 of the 2015 IFC;
 - (iii) LP-gas commercial food service appliances used for food-preparation in accordance with Section 6103.2.1.7 of the 2015 IFC; and
 - (iv) LP-gas cooking devices having an LP-gas container that does not exceed a water capacity of 2.5 pounds (1.13 kg).
- (e) **Portable generator separation.** Portable generators and other internal combustion power sources shall be separated from the sugarhouse, agricultural products, and combustible material, such as leaves, weeds, dry grass or similar debris, by a minimum of 10 feet (3048 mm).

Section 1228.14 Means of egress.

The means of egress in the sugarhouse shall be maintained in accordance with Section 1031 of the 2015 IFC and shall conform to the following requirements.

- (a) **Exit discharge locations.** The maximum travel distance from any point within the sugarhouse to an exit discharge shall not exceed 75 feet (22 860 mm).
- (b) **Alternative egress doors.** Overhead doors (garage type), sliding doors, and similar alternatives to side-hinged swinging doors shall be permitted within the means of egress system, provided that they remain fully open and are secured to prevent them from being closed during an alternative activity.
- (c) **Locks and latches.** Egress doors shall be readily operable from the egress side without the use of a key or special knowledge or effort, except as permitted by Section 1010.1.9.3 of the 2015 IFC.
- (d) **Occupant load.** The occupant load of the sugarhouse or portion thereof during an alternative activity shall not exceed the lesser of:
 - (1) the capacity of the means of egress calculated in accordance with Sections 1005.1 and 1006.3.1 of the 2015 IFC; or

- (2) 150 persons calculated in accordance with Section 1004.1 of the 2015 IFC and based on the most restrictive occupant load factor applicable to all proposed alternative activities.

For the purpose of compliance with Sections 1005.1 and 1006.3.1 of the 2015 IFC, an existing sugarhouse shall be considered as a Group U occupancy. For the purpose of compliance with Section 1004.1 of the 2015 IFC, an alternative activity shall be classified as the function that it most nearly resembles in Table 1004.1.2 of the 2015 IFC.

The code enforcement official may require a reduction in the allowable occupant load when it is apparent that the floor loading resulting from the proposed alternative activity cannot be sustained by the existing structural members. The reduced occupant load shall be determined by a registered design professional.

- (e) **Posting of occupant load.** The occupant load of each room or space shall be posted in a conspicuous place near the main exit or exit access doorway from the room or space. Posted signs shall be of an approved, legible, permanent design and shall be maintained by the owner or authorized agent.
- (f) **Overcrowding and general life safety.** Overcrowding or admittance of any person beyond the approved capacity of the sugarhouse or a portion thereof shall not be allowed. The code enforcement official, upon finding any overcrowding conditions or obstructions in aisles, passageways or other means of egress, or upon finding any condition that constitutes a life safety hazard, may stop an event until such condition or obstruction is corrected. The building owner or authorized agent shall be responsible to ensure buildings, or portions thereof, are not overcrowded.
- (g) **Exit signs.** Exit signs shall comply with the following requirements:
 - (1) **Where required.** Exits and exit access doors shall be marked by an approved exit sign readily visible from any direction of egress travel. The path of egress travel to exits and within exits shall be marked by readily visible exit signs to clearly indicate the direction of egress travel in cases where the exit or the path of egress travel is not immediately visible to the occupants. Intervening means of egress doors within exits shall be marked by exit signs. Exit sign placement shall be such that no point in an exit access corridor or exit passageway is more than 100 feet (30480 mm) or the listed viewing distance for the sign, whichever is less, from the nearest visible exit sign.

Exceptions:

 - (i) Exit signs are not required in rooms or areas that require only one exit or exit access.
 - (ii) Main exterior exit doors or gates that are obviously and clearly identifiable as exits need not have exit signs where approved by the code enforcement official.
 - (2) **Graphics.** Every exit sign and directional exit sign shall meet the requirements of Section 1013.6.1 of the 2015 IFC.
 - (3) **Stairway exit signs.** A tactile sign stating "EXIT" and complying with ICC/ANSI A117.1 shall be provided adjacent to each door to an egress stairway.
 - (4) **Exit sign illumination.** Exit signs shall be internally or externally illuminated. The face of an exit sign illuminated from an external source shall have an

intensity of not less than 5 foot-candles (54 lux). Internally illuminated signs shall provide equivalent luminance and be listed for the purpose.

Exceptions:

(i) Approved self-luminous exit signs that provide evenly illuminated letters shall have a minimum luminance of 0.06 foot-lamberts (0.21cd/m²).

(ii) Tactile signs required by section 1013.4 of the 2015 IFC need not be provided with illumination.

(5) **Power source.** Exit signs shall be illuminated at all times. To ensure continued illumination for a duration of not less than 90 minutes in case of primary power loss, the sign illumination means shall be connected to an emergency power system provided from storage batteries, unit equipment or an on-site generator. The installation of the emergency power system shall be in accordance with Section 604 of the 2015 IFC.

Exception: Approved exit sign illumination means that provide continuous illumination independent of external power sources for a duration of not less than 90 minutes, in case of primary power loss, are not required to be connected to an emergency electrical system.

(h) **Means of egress illumination.** Illumination shall be provided in the means of egress in accordance with paragraph (1) of this subdivision. Under emergency power, means of egress illumination shall comply with paragraph (2) of this subdivision. Sugarhouses not authorized to conduct alternative activities after daylight hours and where natural lighting is provided shall not be required to comply with the provisions of this subdivision when approved by the code enforcement official.

(1) **Illumination required.** The means of egress serving a room or space shall be illuminated at all times that the room or space is occupied.

Exception: Aisle accessways.

(i) **Illumination level under normal power.** The means of egress illumination level shall be not less than 1 footcandle (11 lux) at the walking surface.

(2) **Emergency power for illumination.** The power supply for means of egress illumination shall comply with Sections 1008.3 through 1008.3.5 of the 2015 IFC.

(i) **Maintenance.** The emergency power system shall be maintained in accordance with Section 604 of the 2015 IFC.

(i) **Unobstructed means of egress.** The means of egress shall be unobstructed at all times and shall be obvious to the occupants.

(j) **Aisles.** The minimum width of aisles and aisle accessways serving as a portion of the exit access in the means of egress system shall comply with one of the following:

(1) Forty-two inches (1067 mm) for aisles having seating on both sides.

Exceptions:

(i) Thirty-six inches (914 mm) where the aisle serves less than 50 seats.

(ii) Thirty inches (762 mm) where the aisle does not serve more than 14 seats.

- (2) Thirty-six inches (914 mm) for level or ramped aisles having seating on only one side.

Exception: For other than ramped aisles that serve as part of an accessible route, 30 inches (762 mm) where the ramped aisle does not serve more than 14 seats.

- (3) In sale and marketing areas, the minimum clear aisle width shall be determined by Section 1005.1 of the 2015 IFC for the occupant load served, but shall not be less than that required for corridors by Section 1020.2 of the 2015 IFC.

- (k) **Aisle accessway.** Aisle accessway shall comply with this section.

(1) **Width.** The minimum width of aisle accessways serving non-fixed tables shall comply with Section 1029.12.1.1 of the 2015 IFC. The minimum width of aisle accessways serving non-fixed chairs shall comply with 1029.12.2 through 1029.12.2.2 of the 2015 IFC.

(2) **Length.** The length of travel along the aisle accessway serving non-fixed tables shall comply with Section 1029.12.1.2 of the 2015 IFC.

- (l) **Handrails.** Handrails shall be provided in accordance with the following requirements:

(1) **Ramp handrails.** Ramps with a rise greater than 6 inches (152 mm) shall have handrails on both sides complying with Section 1014 of the 2015 IFC.

(2) **Stairway handrails.** Stairways shall have handrails on at least one side. Handrails shall be located so that all portions of the stairway width required for egress capacity are within 44 inches (1118 mm) of a handrail.

Exception: Aisle stairs provided with a center handrail are not required to have additional handrails.

(3) **Height.** Handrail height, measured above stair tread nosing, shall be uniform, not less than 30 inches (762 mm) and not more than 42 inches (1067 mm).

- (m) **Stairway discharge identification.** An interior exit stairway or ramp that continues below its level of exit discharge shall be arranged and marked to make the direction of egress to a public way readily identifiable.

Exception: Stairways that continue one-half story beyond their levels of exit discharge need not be provided with barriers where the exit discharge is obvious.

- (n) **Exit Discharge.** The exit discharge from the sugarhouse shall comply with Section 1028 of the 2015 IFC.

Section 1228.15 Toilet facilities.

Toilet facilities in accordance with this section and Sections 403.1 and 403.1.1 of the 2015 IPC shall be provided for occupants partaking in an alternative activity. Where a proposed alternative activity is not specifically described in Table 403.1 of the 2015 IPC, such activity shall be classified in the occupancy that the alternative activity most nearly resembles, as determined by the code enforcement official.

- (a) **Portable restrooms.** Portable restrooms that include water closets with lavatories (or hand sanitizers in lieu of lavatories) shall be permitted as toilet facilities to satisfy the requirements of this section. When portable restrooms are provided, at least one shall be accessible and located on an accessible route.

- (b) **Location of toilet facilities.** Travel distance to toilet facilities shall not exceed 500 feet and shall not be located more than one story above or below the space required to

be provided with a toilet facility. Toilet facilities may be located in adjacent buildings that are under the same ownership or control as the sugarhouse.

- (c) **Door locking.** The egress door for toilet rooms serving multiple occupants shall not be lockable from inside the toilet room.
- (d) **Private sewage disposal systems.** An onsite sewage treatment system serving a sugarhouse shall have the capacity to serve the alternative activity. Portable restrooms in accordance with this section shall be provided when such system does not have the required capacity or if capacity cannot be determined.

Section 1228.16 Accessibility.

Sugarhouses shall be made accessible in accordance with this section to individuals partaking in an alternative activity unless providing accessibility is technically infeasible. When it is technically infeasible to provide accessibility, accessibility shall be provided to the maximum extent that is feasible. When it is feasible to provide accessibility, such accessibility shall accommodate the widest range of disabilities practicable. (For example, if providing accessibility in conformance with this section to individuals who use wheelchairs would be technically infeasible, the facility shall be made accessible to persons with other types of disabilities, such as those who use crutches, those who have impaired vision or hearing, or other impairments). Work required by this subdivision shall comply with Chapter 11 of the 2015 IBC.

- (a) **General.** Sugarhouses shall have at least one accessible building entrance that serves an area of alternative activity and either:

- (1) an accessible passenger loading zone and an accessible route, or
- (2) accessible parking and an accessible route.

An accessible route shall connect an accessible passenger loading zone or accessible parking to the accessible building entrance.

Accessible elements required by this subdivision shall not be required when the area of alternative activity, the existing entrance, and the interconnecting rooms and/or spaces are not accessible and alterations and/or repairs to any such area or entrance is not proposed or otherwise required by this Part.

- (b) **Alterations and repairs.** Portions of a sugarhouse that are altered and/or repaired for compliance with other sections of this Part shall be made accessible when such alterations and/or repairs are located in an area where an alternative activity will occur or will affect accessibility to an area where an alternative activity will occur from an accessible entrance required by subdivision (a) of this section.

- (1) **Alternative activity area expansion.** Alterations made to a sugarhouse for the sole purpose of accommodating a higher occupant load during an alternative activity shall include the accessible features described in subdivision (a) of this section in addition to at least one accessible route from an accessible building entrance to the alternative activity area.

- (c) **Additions.** Additions made to an existing sugarhouse shall comply with this section and Section 1105.1 of the 2015 IEBC when such addition is for the sole purpose of accommodating a higher occupant load during an alternative activity.

- (d) **Ramps.** Ramps provided to satisfy the requirements of this section shall be permitted to comply with Section 705.1.4 of the 2015 IEBC.

- (e) **Thresholds.** Existing thresholds that have a beveled edge on each side with a slope not exceeding 1 unit vertical to 2 units horizontal may have a maximum height of $\frac{3}{4}$ " (19mm). New thresholds shall comply with the requirements for new construction.

Section 1228.17 Incorporation by reference.

The following publications are hereby incorporated by reference into this Part.

- (a) 2015 International Building Code (2015 IBC), publication date: May 30, 2014, third printing, published by the International Code Council, Inc.
- (b) 2015 International Existing Building Code (2015 IEBC), publication date: May 30, 2014, fifth printing, published by the International Code Council, Inc.
- (c) 2015 International Fire Code (2015 IFC), publication date: May 30, 2014, third printing, published by the International Code Council, Inc.
- (d) 2015 International Plumbing Code (2015 IPC), publication date: May 30, 2014, third printing, published by the International Code Council, Inc.
- (e) 2016 Uniform Code Supplement, publication date: March, 2016, published by the New York State Department of State.

Copies of the 2015 IBC, 2015 IEBC, 2015 IFC and 2015 IPC may be obtained from the publisher at the following address:

International Code Council, Inc.
500 New Jersey Avenue, NW, 6th Floor
Washington, DC 20001

Copies of the 2016 Uniform Code Supplement may be obtained from the New York State Department of State at the following address:

New York State Department of State
One Commerce Plaza, 99 Washington Avenue
Albany, NY 12231-0001

All publications incorporated by reference into this Part are available for public inspection and copying at:

New York State Department of State
One Commerce Plaza, 99 Washington Avenue
Albany, NY 12231-0001

Appendix C - Guidelines on use of bleach for sanitizing food equipment

The makers of Clorox bleach say:

“From our EPA master label, the instructions for sanitizing food contact surfaces and equipment, such as dishes, pots and pans, glasses, utensils, refrigerators, freezers and more, are as follows:

Wash surfaces and equipment thoroughly; then soak two minutes in a 200 ppm available chlorine solution made with hot water. Use chlorine test strips to adjust to 200 ppm available chlorine. Drain dry. (Do not use on steel, aluminum, silver, or chipped enamel. Disinfect these by scalding.) To mix a 200 ppm available chlorine solution, dilute 1 Tablespoon. [Clorox® Regular-Bleach](#) per 1 gallon of water. Note that you don’t rinse the items once you apply the bleach solution—they are simply allowed to air dry.”

They also note that you must only use Regular Bleach – never the splashless or scented varieties, which contain other components besides bleach.



Guidelines for the Use of Chlorine Bleach as a Sanitizer in Food Processing Operations

William McGlynn

Extension Horticultural Food Scientist

Use of chlorine bleach for sanitizing equipment and food handling articles:

Dilute mixtures of chlorine bleach and water are a common and cost-effective method for sanitizing equipment in food processing operations. When used properly, chlorine bleach can be a very effective method of killing undesirable microorganisms. Processors should be aware, however, that there are regulations concerning the use of this sanitizer. The germ-killing effect in a solution of chlorine bleach and water is due to available chlorine, present as hypochlorite and hypochlorous acid. Federal regulations (21 CFR Part 178) permit the use of sanitizing solutions containing sodium hypochlorite on food processing equipment and food contact articles with the following provisions:

- Equipment or articles sanitized with the solution must be allowed to drain adequately before contact with food.
- Solutions used for sanitizing equipment shall not exceed 200 parts per million (ppm) available chlorine.

As shown in Table 1, about one tablespoon (1/2 fluid ounce, 15 ml) of typical chlorine bleach per gallon of water is the maximum that should be used for sanitizing food contact surfaces, according to federal regulation. If higher concentrations are used, the surface must be rinsed with potable water after sanitizing. Contact times of one to five minutes are usually sufficient to achieve a thorough kill, depending on chlorine concentration and organic load.

Table 1 – Amount of chlorine bleach per gallon of water for a given chlorine concentration¹

Amount of chlorine bleach per gallon of water	Approximate concentration of total chlorine ² (ppm) ³
1 teaspoon	65
1 tablespoon	200
1 fluid ounce	400
1/4 cup	800
1/2 cup	1600
2/3 cup	2200
3/4 cup	2400
1 cup	3200

1. Assuming 5.25% sodium hypochlorite in chlorine bleach.

2. Typically present as both hypochlorous acid and hypochlorite ion.

3. ppm = parts per million.

Use of chlorine bleach for sanitizing raw fruits and vegetables:

In addition to sanitizing food contact surfaces, chlorine bleach solutions may be used for sanitizing raw fruits and vegetables during the washing or peeling process. The federal regulations that apply differ slightly from those for sanitizing solutions given above. The regulations (21 CFR Part 173) specify two conditions for the permitted use of hypochlorite solutions in washing produce:

- The concentration of sanitizer in the wash water must not exceed 2000 ppm hypochlorite.
- The produce must be rinsed with potable water following the chlorine treatment.

Most operations, unless the produce is very dirty, will not need a sanitizer concentration greater than 200 ppm total chlorine to achieve the desired sanitizing effect. Contact times of one minute or greater are typically sufficient to achieve a thorough kill.

The regulations do not specify a permissible residual level of chlorine. Presumably, the fresh water rinse eliminates any potential problem with residual chlorine. As a practical matter, residual chlorine would in most foods produce highly objectionable flavors and odors well before becoming a safety hazard. Food processing in-plant chlorination systems typically produce water for processing with residual available chlorine levels of no more than 0.5 ppm. For container cooling or general washing, residual available chlorine levels of 2 to 7 ppm are commonly used. Typical municipal water systems produce potable water with a residual available chlorine level of 0.25 to 2 ppm.

Some considerations when using chlorine bleach as a sanitizer:

Any chlorine bleach that is used for making a sanitizing solution, whether for equipment or raw produce, must be of sufficient purity to be categorized as a

“food grade” substance. Some commercially available household chlorine bleaches contain fragrances, thickeners and/or other additives not approved for food use. These products are not suitable for making sanitizing solutions. If any chemicals are used to alter or buffer the pH of a sanitizing solution, these likewise should be “food grade.” And finally, only potable water should be used in making sanitizing solutions.

Chlorine bleach has a distinctive, powerful and unpleasant odor. It is an effective sanitizer but can easily damage the quality of processed foods if not used properly. Care should be taken in using chlorinated water for brine or syrup. Even at low levels, chlorinated water may produce undesirable off-flavors in processed foods. This may be a particular problem with syrup or starch solutions since these tend to entrap the chlorine. Heating chlorinated water to typical processing temperatures, 150° to 200°F, prior to formulating the brine, syrup or sauce will minimize potential problems; this amount of heat easily drives off residual chlorine.

Chlorine loses its effectiveness quickly in the presence of oil, dirt and organic material. Wash water should be changed when it becomes dirty. For very dirty produce, the best approach is to have an initial washing step to remove excess dirt prior to the sanitizing treatment.

Chlorine solutions are by nature highly corrosive; they should not be used on surfaces that are prone to rust. Other sanitizers, such as quaternary ammonia compounds, may often be used on these surfaces. In addition, chlorine solutions are irritating to the skin and the fumes irritate the respiratory tract. These solutions should only be used with adequate ventilation and protective clothing.

The effectiveness of chlorine as a sanitizer is determined in large part by pH. This is because when sodium hypochlorite (NaOCl) is mixed with water an equilibrium reaction between hypochlorite and hypochlorous acid (HOCl, the active sanitizing agent) occurs. This reaction occurs as follows:

First, the NaOCl dissolves and chemically breaks apart in the water.



Then, the hypochlorite ion (OCl⁻) reacts with the hydrogen ions in the water to form hypochlorous acid.



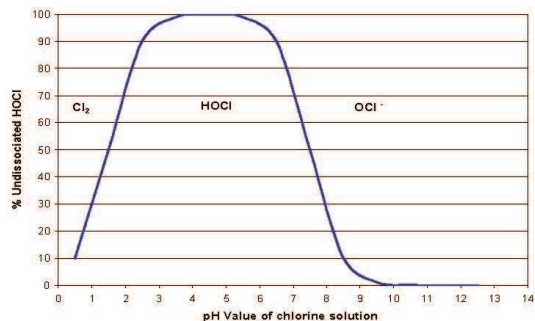
As seen in Figure 1 below, most of the chlorine is in the form of hypochlorous acid. As the pH drops, another change occurs, resulting in an equilibrium reaction between hypochlorous acid and free chlorine. The chlorine molecules form chlorine gas (Cl₂) according to the following reaction:



This is a reaction to be aware of since chlorine gas is highly toxic. For this reason, never add acid to a chlorine solution without monitoring its pH. One common source of acid is vinegar - often used as a cleaning aid. Some commercial cleaning agents are also acidic.

The chemistry of hypochlorite and water mixtures described above shows that chlorine sanitizing rinses are most effective in an

Figure 1 -- Effect of pH on hypochlorous acid content.



acid pH range. The recommended pH range for an effective and safe sanitizing solution is 6.5 to 7.5. Solutions with pH values lower than 6.0 are more corrosive; this will shorten the life of treated equipment. Solutions with pH values lower than 5.0 will begin to generate potentially harmful levels of chlorine gas, and solutions with pH values greater than 8.0 quickly lose their effectiveness as sanitizers.

High pH values may become an issue if the water used for the sanitizing solution is naturally alkaline (pH > 7.0). It may also be a problem if detergent residues, which are usually alkaline, are left on equipment or food contact surfaces sanitized with chlorine. Be sure to rinse surfaces as well as possible before using a chlorine sanitizing rinse.

Chlorine test kits are available to test the level of active chlorine present in a solution. These commonly involve a color change. Some tests employ strips of paper treated with chemicals that change color based on the chlorine concentration and some employ liquid reagents that change color when added to a chlorine solution. In either case, the resulting color is compared to a standard chart or read by a simple color meter to give a measure of active chlorine present in solution. These test kits are available from scientific supply houses and/or sanitizer supply companies. Many kits have a limited range of measurable chlorine concentrations, often with an upper limit of 10-100 ppm. In these cases, higher chlorine concentrations may be measured by diluting the test sample as needed and using the dilution factor to figure the actual chlorine concentration.

References

- Troller, J.A. "Cleaning and Sanitizing," Chapter 5 in *Sanitation in Food Processing*, Academic Press, New York, NY, pp. 95-101, 1983.
- White, G.C. *Handbook of Chlorination*, 2nd ed. Van Nostrand Reinhold, New York, NY, pp 150-213, 1986.
- National Food Processors Association. "Food Plant Sanitation," Chapter 5 in *Canned Foods: Principles of Thermal Process Control, Acidification, and Container Closure Evaluation*, 6th ed. A Gavin and L.M. Weddig (Ed.), The Food Processors Institute, Washington D.C., pp. 35-47, 1995.

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Appendix D – Reverse Osmosis Cleaning Guidelines

New York State Department of Environmental Conservation

Division of Water

Bureau of Water Permits, 4th Floor
625 Broadway, Albany, New York 12233-3505

Phone: (518) 402-8111 • Fax: (518) 402-9029

Website: www.dec.ny.gov



Joe Martens
Commissioner

September 16, 2011

Ms. Helen Thomas
Executive Director
New York State Maple Producers Association
301 Myron Road
Syracuse, NY 13219-1227

Re: SPDES Permit for Maple Syrup Production Using Reverse Osmosis

Dear Ms. Thomas:

This letter is to clarify whether a SPDES permit will be required for the discharge of wash water used to clean reverse osmosis (RO) machines used in the maple syrup production process. The New York State Department of Environmental Conservation (the Department) is in receipt of an August 25, 2011 letter from the New York State Maple Producers Association providing detailed information on the characteristics of the wash water used to wash the machine and a better understanding of the machine washing procedures.

According to the documentation provided in the August 25th letter, the typical quantity of this wash water is no more than 10-25 gallons a day during the entire maple syrup production season from February to April. The documentation also indicates that the caustic soda in the wash water is being neutralized using citric acid while the wash water is still in the machine before being discharged. The Department understands that the wash water will be allowed to cool down to room temperature before being drained from the machine. It is the Department's understanding that the wastewater from this process contains no pollutants of concern that could cause a contravention of water quality standards.

Therefore, after consideration of the quantity of wash water used in each wash cycle, the characteristics of the wash water, and the manufacturer's recommended procedure for washing the RO machine and neutralizing the wash water, the Department has concluded that a SPDES permit will not be required for discharge of the wastewater provided that :

1. the characteristics of the wash water remain the same as disclosed in your August 25th letter;
2. maple syrup producers follow the manufacturer recommended RO machine washing procedure as provided in the August 25th letter; and
3. the wash water is allowed to equilibrate to room temperature before being discharged

If you have further questions regarding this letter, please contact me at (518) 402-8111 to discuss.

Sincerely,



Koon S. Tang, P.E
Director, Bureau of Water Permit

cc: James Tierney
Mark Klotz
Thomas Cullen
Scott Crisafulli
Andrea Dzierwa
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**New York State Maple Producers
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August 25, 2011

Koon S. Tang, P.E.
Director Bureau of Water Permit, DOW
625 Broadway, 4th Floor
Albany, NY 12233-3506

Dear Mr. Tang,

The NY Maple Producers' Association looks forward to satisfying clean water standards with the maple sap reverse osmosis membrane wash procedures that are outlined in the accompanying documentation.

As we discussed on August 18, the cleaning of the reverse osmosis membrane with the lye-based cleaning agents available creates 10-25 gallons of wash water that has a pH that can range from 10.5-11. With the use of citric acid this wash water can be neutralized right in the RO membrane chamber, at the end of the cleaning cycle, to a pH of 6.5 -7.0.

The attached documentation includes the MSDS on citric acid, the MSDS on both recommended cleaning agents, the RO equipment vendor's recommendation for cleaning, and a page from their 2011 catalogue showing the availability of citric acid.

The NY Maple Producers' Association is committed to educating the maple industry in NY about this procedure. We appreciate your department's involvement in determining the best practice for RO cleaning, and in striving to eliminate permit paperwork and fees for Maple RO usage.

Regards,

Helen Thomas
Executive Director

Appendix E – NYS Maple Syrup Grading Regulation

1 CRR-NY 270.1NY-CRR

OFFICIAL COMPILATION OF CODES, RULES AND REGULATIONS OF THE STATE OF NEW YORK

TITLE 1. DEPARTMENT OF AGRICULTURE AND MARKETS

CHAPTER VI. FOOD CONTROL

SUBCHAPTER D. STANDARDS OF IDENTITY FOR CEREAL FLOURS AND RELATED PRODUCTS, MILLED RICE, MACARONI AND NOODLE PRODUCTS, BAKERY PRODUCTS AND OLIVE OIL (ARTICLE 17-A AGRICULTURE AND MARKETS LAW)

PART 270. MAPLE SYRUP

1 CRR-NY 270.1

270.1 Maple syrup: identities; label statements.

(a) Definitions.

For the purpose of this section, the following terms shall have the following meanings, unless the context clearly indicates otherwise:

(1) *Light transmittance* means the fraction of incident light at a specified wavelength that passes through a representative sample of a particular sub-grade of Grade A maple syrup.

(2) *Soluble solids, expressed as a percentage*, means the proportion of maple sap solids in the applicable solvent.

(3) *T_c* means the percentage of light transmission through maple syrup, measurable by a spectrophotometer, using matched square optical cells having a 10-millimeter light path at a wavelength of 560 nanometers, the color values being expressed in percent of light transmission as compared to A.R. Glycerol fixed at 100 percent transmission.

(b) Standards of identity.

(1) *Maple syrup* is the liquid made by the evaporation of pure sap or sweet water obtained by tapping a maple tree. Maple syrup contains minimum soluble solids of 66.0 percent and maximum soluble solids of 68.9 percent. Maple syrup includes, and is either, Grade A Maple Syrup or Processing Grade Maple Syrup, as defined in paragraphs (2) and (3) of this subdivision.

(2) *Grade A maple syrup* means maple syrup that is not fermented, is not turbid, and contains or has no objectionable odors, off-flavors or sediment. Grade A maple syrup must fall within one of the color and taste sub-grades of Grade A maple syrup set forth in subparagraph (i), (ii), (iii), or (iv) of this paragraph.

(i) Grade A golden color and delicate taste maple syrup has a uniform light golden color, a delicate to mild taste, and a light transmittance of 75 percent *T_c* or more.

(ii) Grade A amber color and rich taste maple syrup has a uniform amber color, a rich or full-bodied taste, and a light transmittance of 50 percent - 74.9 percent *T_c*.

(iii) Grade A dark color and robust taste maple syrup has a uniform dark color, a robust or strong taste, and a light transmittance of 25 percent - 49.9 percent *T_c*.

(iv) Grade A very dark and strong taste maple syrup has a uniform very dark color, a very strong taste, and a light transmittance of less than 25 percent *T_c*.

(3) *Processing grade maple syrup* means maple syrup that does not meet the requirements for Grade A maple syrup set forth in paragraph (2) of this subdivision. Processing Grade Maple Syrup may not be sold, offered for sale or distributed in retail food stores or directly to consumers for household use.

(c) Nomenclature label statement.

(1) The name of the food defined in paragraph (b)(2) of this section is "Grade A Maple Syrup". The name "Grade A Maple Syrup" must conspicuously appear on the principal display panel of the food's label, and the words "golden color and delicate taste", "amber color and rich taste", "dark color and robust taste", or "very dark color and strong taste", as appropriate, must also

conspicuously appear on the food's principal display panel in close proximity to the food's name and in a size reasonably related to the size of the name of the food.

(2) The name of the food defined in paragraph (b)(3) of this section is "Processing Grade Maple Syrup". The name "Processing Grade Maple Syrup" must conspicuously appear on the principal display panel of the food's label, and the words "For Food Processing Only" and "Not for Retail Sale" must also conspicuously appear on the food's principal display panel in close proximity to the food's name and in a size reasonably related to the size of the name of the food.

1 CRR-NY 270.1

Current through August 31, 2017

NEW YORK STATE FOOD LABELING

This pamphlet is a brief summary of the labeling regulations governing foods offered for sale in New York State. It is not meant to be all inclusive of all of the labeling requirements. It is strongly suggested that labels be submitted to this agency for review prior to printing.

For specific information write to:

State of New York
Department of Agriculture and Markets
Division of Food Safety and Inspection
Attn: Economic Section
10B Airline Drive
Albany, NY 12235

FSI-514 (Revised 5/01)

Five Basic Label Requirements

- Identity of Food in Package Form
 - Name of Manufacturer, Packer or Distributor
 - Place of Business
 - Ingredient Declaration
 - Net Quantity of Contents
-
-

➤ IDENTITY OF FOOD IN PACKAGE FORM

- a. The principal display panel of a label for a food in package form shall bear as one of its principal features a statement of the identity of the commodity by its common or usual name.
- b. Where a food is marketed in various forms (grated, sliced, diced, etc.) the particular form shall be considered as part of the identity statement.
- c. The statement of identity shall be present in bold type on the principal display panel and shall be in a size reasonably related to the most prominent printed matter.

➤ Name of Manufacturer, Packer or Distributor

- a. In the case of a corporation, only the actual corporate name, and this may be preceded or followed by the name of the particular division involved.
- b. In the case of an individual, partnership or association, the name under which the business is conducted shall be used.
- c. When the food is not manufactured by the person whose name appears on the label, a qualifying phrase such as "Manufactured for _____", "Distributed by _____", or other expression of facts, shall appear with the name.

➤ Place of Business

The place of business shall include the street address, city, State and ZIP code. However, the street address may be omitted if it is shown in a current city or telephone directory.

➤ Ingredient Declaration

- a. The ingredients shall be listed by their common or usual name in descending order of predominance by weight, on a single panel of the label.
- b. The name of the ingredient shall be a specific name and not a collective name.
 1. If the ingredient is a designated spice, flavoring or natural color, it need only be stated as spices, artificial color or artificial flavor. Colorings subject to certification (FD&C) must be listed by their specific name, i.e. FD&C Yellow #5.
 2. If an ingredient used in the product conforms to a standard of identity or is a multi-ingredient product, its ingredients are required to be listed on the label.
 3. When blends of fats and/or oils are used, the common or usual name of each fat or oil used must be listed in parenthesis following the term vegetable shortening, animal fat or marine oil.
 4. If an individual fat and/or oil ingredient is used, not a blend, the common name of that product must be listed in the correct order of predominance.
- c. No abbreviations of an ingredient's common or usual name are permitted, unless explicitly provided for in the statutes.
- d. Water used in fabricated foods shall be declared on the label in its order of predominance.

➤ Net Quantity of Contents

- a. The principal display panel of a label for a food in packaged form shall bear a declaration of net quantity of contents.

1. The declaration shall be expressed in terms of avoirdupois pound and ounce, volume, and/or numerical count.
2. The declaration shall appear as a distinct item within the lower 30 percent of the principal display panel. The declaration shall be printed in boldface print or type in letters and numbers in a size in relationship to the total square inches of the principal display panel.

<u>Area of PDP</u>	<u>Minimum Type Size</u>
5 sq. inches or less	1/16 inch (1.6 mm/6 point)
> 5 sq. inches, but < 25 sq. inches	1/8 inch (3.2mm/14 point)
> 25 sq. inches, but < 100 sq. inches	3/16 inch (4.8mm/20 point)

3. The declaration of net quantity of contents shall be expressed in the following terms:
 - a. Weight (one pound, but less than four pounds) expressed in ounces and followed by the largest whole unit in parenthesis, i.e. NET WT. 24 OZ (1 LB 8 OZ).
 - b. Fluid measure (one pint, but less than one gallon) expressed in fluid ounces and followed by the largest whole unit in parenthesis, i.e. 20 FL OZ (1 PT 4 OZ).
4. A separate statement of the net quantity of contents in terms of the metric system is required to appear on the principal display panel as part of the required declaration, i.e. NET WT 9 OZ (255g) or 9 FL OZ (266 ml).

➤ **General Label Information**

a. **Principal Display Panel:**

The term “principal display panel” as it applies to food in packaged form means the part of the label that is mostly to be displayed, presented, shown or examined under customary conditions of display for retail sales. The principal display panel shall be large enough to accommodate all the mandatory label information required to be placed thereon with clarity and conspicuousness and without obscuring design, vignettes, or crowding.

b. Information Panel:

The term "information panel" as it applies to packaged food means that part of the label immediately contiguous and to the right of the principal display panel as observed by an individual facing the principal display panel.

c. Labeling Information Requirements:

All information appearing on the principal display panel or information panel shall appear prominently and conspicuously, but in no case may the letters/numbers be less than one-sixteenth of an inch in height, except for those requirements previously addressed.

d. Language:

1. All required label information shall appear in the English language.
2. If the labeling bears any statutory information in a foreign language, all the required labeling information shall appear in both the foreign and English language.

e. Imitation Foods:

If any food product is an imitation of another, and is nutritionally inferior to that product, it must be labeled "Imitation _____", with the space being filled in with the name of the food imitated, and with the word "imitation" in type of uniform size and prominence as used for the name of the food.

f. Packaging:

A package or commodity in packaged form means any commodity put up or packaged in any manner in advance for retail sale. This should include cellophane wrapped products kept in a closed display case, even if these products need to be weighed and priced at the time of sale.

g. Nutrition Information:

Information as to the requirements for inclusion of nutrition information on a label should be addressed to this agency.