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Water Quality

What's in Your Water?

Quality & Food Safety




Water is used in food processing and production facilities as an ingredient or as part of the process (chilling, rinsing), and for sanitation and personnel hygiene (hand washing). In agricultural settings water is used for irrigation, chemical and fertilizer applications; fluming, washing and cooling of product; and equipment cleaning and handwashing. With water involved in so many aspects of food production it easy to see that water quality can greatly impact the safety of food and why a safe, adequate supply is critical. While this factsheet refers to water only - if your process uses ice or steam it must be included and is subject to the same requirements as water.

Water Sources

Water sources can vary; businesses close to city centers with access to municipal water, or more remote with a well have low risk water sources. Agricultural sources can also include ponds fed by ground or rain water (moderate risk sources), ponds fed from streams or run-off, rivers, and creeks which are high risk sources. Agricultural water sources must be assessed annually to identify any potential sources of contamination, such as livestock access, recreational use, chemical or manure run off, irrigation pipes. If a contamination source is identified then an alternative water source must be used or corrective measures could be implemented such as building barriers, levelling the ground to prevent run off, or increasing the time interval between irrigation and harvest.

Water Storage

In the case of agricultural water storage tanks or containers - they must be rust free and closed when not in use. Tanks must be cleaned at the beginning of the season or the water tested.

Water Testing

Water used in food facilities as well as water used in an agricultural setting for overhead spraying and misting, washing of products, equipment, and hands must be potable. Potable means that it is safe to drink and meets Health Canada's requirements for drinking water (*Canadian Drinking Water Guidlines*). Testing frequency will depend on the water source. Monthly testing for microbiological parameters is recommended when well water is used and semi-annually for municipal water sources. Additionally, if using a municipal water source, request a copy of their test results at least annually.

Water results must meet the *Canadian Drinking Water Guidelines* potability standards for:

- Total coliforms none detectable per 100 mL
- *E. coli* none detectable per 100 mL

Quality of the water should also be assessed depending on the use. Detailed chemical analysis tests should be done for water used as a product ingredient (i.e. juice processing), to ensure that the water meets *Canadian Drinking Water Guidelines* for chemical and physical parameters (i.e. mineral content). If water is not used as an ingredient, quality tests may be less frequent (annual) with quality observations (color, turbidity, odor, etc.) conducted on a regular basis.

Agricultural water uses other than those listed at the beginning of this section need to follow *Canadian Water Quality Guidelines for the Protection of Agricultural Water Uses*. Annual tests for agricultural water are recommended but not required.

How to Collect a Water Sample:

1. Use a sterile container obtained from the lab. Do not open until ready to collect sample.
2. Wash your hands and wear gloves when collecting sample to prevent contamination.
3. Remove the screen/hose nozzle, etc. depending on the sampling site.
4. Open tap fully and allow the water to run for two minutes before collecting sample.
5. Reduce flow when collecting sample to prevent splashing.
6. Maintain sterility of container when collecting sample: Hold the sample container at the base, remove the sample container cap with your free hand, take care not to touch the edge of the bottle, inside of the lid or sample container - do not put the lid down!
7. Leave a little air space in the container to allow for mixing.
8. Take samples to the lab immediately. Place in a cooler with ice for transport. If delivery is delayed, store sample in fridge. A new sample will need to be collected (in a new container) if the stored sample cannot be delivered to lab within 24 hours of collection.

Sterile water sample container obtained from the lab.

What if the water doesn't meet requirements?

1. If water is not used as an ingredient or directly on product, operations may continue using an alternate source of potable water for drinking and hand washing provided that washing is followed by hand sanitizer. All use of facility water should cease immediately.
2. Complete a Deviation/Corrective Action Report. Be sure to consider any product that may be affected.
3. Water is to be retested immediately taking a sample from each of the sample sites to determine source.
4. If any of the second set of water tests is out of compliance with the potability standards, the cause must be determined and remedied. If all sites fail it indicates that the well source or municipal water is contaminated. In the latter case the Municipality must be

notified and a boil order may be issued. All production is to cease until the problem can be remedied.

5. Corrective actions may include using an alternate source, water treatment or treatment of wells. Consult an expert for any well treatments i.e. Municipality or Department of Health. An acceptable water test result must be obtained before resuming production.

Water Treatment - What are the Options?

Water treatment may be required to make water potable. Common chemical water treatments are chlorination and boiler feed water chemicals. Key things to keep in mind if treating water with chemicals are:

- Ensure that treatment chemicals are on CFIA's Reference Listing of Accepted Construction Materials, Packaging Materials and Non-Food Chemical Products (or otherwise approved for use)
- Determine frequency of treatment
- Document a procedure for treatment and train staff
- Keep the MSDS sheet on-site
- Test the water to ensure that the appropriate level of chemical is added daily (too little and the treatment is not effective, too much and it becomes a chemical hazard).

Physical water treatment methods include ultraviolet (UV), ozonation, activated carbon filters and reverse osmosis. Ensure that manufacturer's instructions are followed for monitoring, replacement (filters, bulbs on UV systems) and include them in your preventative maintenance program.

Resources

Health Canada's Canadian Drinking Water Guidelines
http://www.hc-sc.gc.ca/ewh-semt/water-eau/drink-potab/guide/index-eng.php

Canadian Water Quality Guidelines for the Protection of Agriculture Water Uses
http://ceqg-rcqe.ccme.ca/download/en/131

Water Testing Labs in Nova Scotia
http://www.novascotia.ca/nse/water/waterlabs.asp

For more information contact:

Elaine Grant
Quality and Food Safety Specialist
Perennia Food and Agriculture Inc.
Tel: 1-902-956-3376
Email: egrant@perennia.ca

 September 2016

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