

Keeping it clean: sanitizers, rodents, and insects in the plant.

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Topics covered

- Definitions: Sterilizing VS sanitizing
- Sanitizing as it relates to bacterial growth
- Characteristics of proper sanitizers with most focus on chlorine bleach: (EPA reg no, dilutions, considerations of equipment they are used on, etc)
- Steps for proper sanitizing
- Common plant critters, where they come from, and what they can carry (focus on rodents, roaches, fungi, and flies)
- How to clean up after pests without spreading pathogens.

Sanitization

- Part 2 Definition – **(tt) *the application of an effective* method or substance to equipment for the destruction of pathogens and of other organisms as far as is practicable. Such method or substance shall not adversely affect the equipment or adversely affect the purity and quality of food.**
- Sanitization is NOT the same as sterilization

Part 2 - Requirements for sanitation

- § 2.18 UTENSILS AND EQUIPMENT - SANITATION - Item 11r.
- All product-contact surfaces of multiuse containers, utensils, and equipment used in the handling, storage, or transportation of milk are **sanitized before each usage** by one of the following methods, or by any method which has been demonstrated to be equally effective:

Part 2 - Requirements for sanitation

- (a) **Complete immersion in hot water** at a temperature of at least **170°F (77°C)** for at least **five minutes**, or exposure to a flow of hot water at a temperature of at least **170°F (77°C)** as determined by use of a suitable accurate thermometer (at the outlet) for at least five minutes.

Part 2 - Requirements for sanitation

- **(b) Complete immersion for at least one minute in, or exposure for at least one minute to a flow of a chemical sanitizer of acceptable strength.** All product-contact surfaces must be wetted by the sanitizing solution, and piping so treated must be filled. Sanitizing sprays may be used. Chemical solutions, once used, shall not be reused for sanitizing but may be reused for other purposes.

Part 2 cont'd

- **§ 2.40 CLEANING AND SANITIZING OF CONTAINERS AND EQUIPMENT - Item 12p.**
- **(a)(1) All multiuse containers and utensils are thoroughly cleaned after each use, and all equipment is thoroughly cleaned at least once each day used.**

Part 2 cont'd

- **(e) All multiuse containers, equipment, and utensils are sanitized before use, employing one or a combination of the methods prescribed under Section 2.18 of this Part (Item 11r). Assembled equipment must be sanitized prior to each day's run.**

Steps for sanitizing

- Rinse
- Clean – chlorinated alkaline cleaner for dairy or food processing equipment to remove fat and protein; avoid household detergents
- Rinse
- Dry (if not using immediately)
- Sanitize immediately before use
- Drain before contact with food

Sanitizers must

- Have an EPA registration number

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- Have instructions of how to prepare the correct concentration for food contact surfaces



Labels can rub off

Sanitizers must

- Have an EPA registration number
- Have instructions on how to prepare the correct concentration for food contact surfaces
- NOT be scented

Proper sanitizer strength for chlorine bleach sanitizers

- 50 ppm hand dip
- 100-200 ppm equipment
- Tested daily
- Tested after prolonged use (hours)
- Test strips from chemical supplier
- Chlorine bleach sanitizer should be replaced when heavily soiled with organic matter



Test strips for chlorine bleach sanitizer

Washing/Sanitizing

- Brushes with solid nylon bristles and hard plastic handles recommended
- Cleaning utensils with wood parts, natural sponges, and metal scouring pads not appropriate.
- Green, plastic scouring pads leave residue; rinse thoroughly!

What bugs us about pests?

- Mechanically spread pathogens from dirty locations (*) to your clean plant (go anywhere)
- Produce or spread allergens
- Transfer undesirable materials from one area to another ex: nesting materials
- They can damage your plant
- They can end up in your product!

Rodent pests

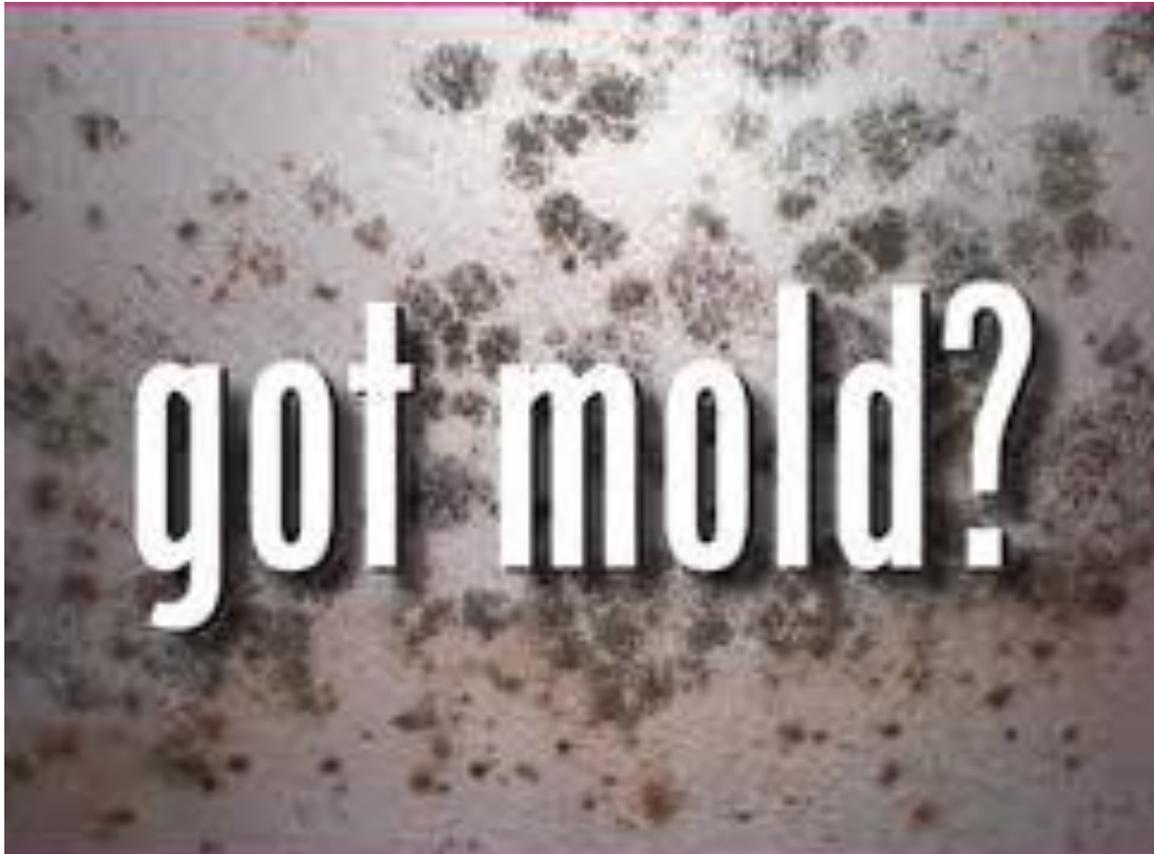
- Can fit through holes as small as $\frac{1}{4}$ inch (mice)
- $\frac{1}{2}$ inch for rats
- Rats nest in underground boroughs
- Carry diseases and host disease vectors
- Excreta deposited where they are active
- Feces: up to 60% of its dry matter is bacteria
- Bacteria 0.1 – 10 μm – small!



Untreated wood in the processing room and coolers can harbor mold.



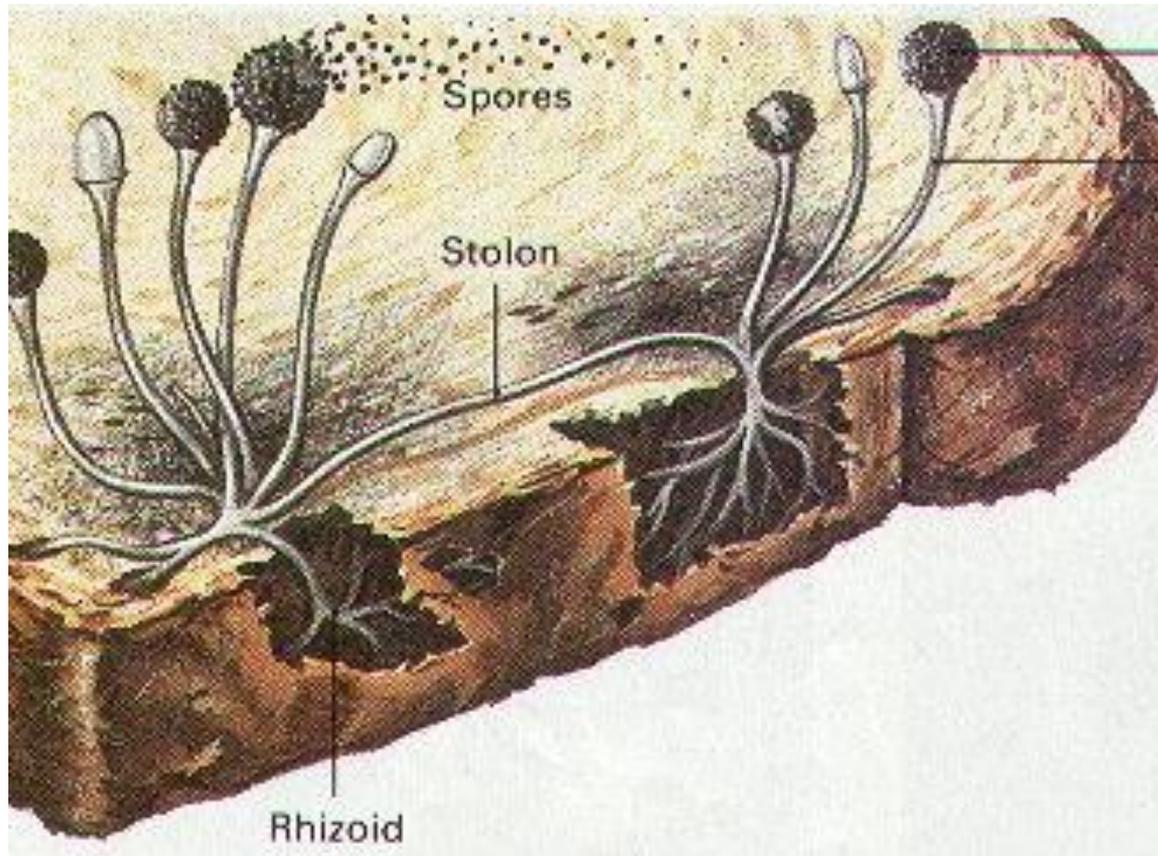




<http://certifieddisaster.com/services/mold-damage/>



If there's a fungus among us...



<http://leavingbio.net/fungus/fungi2.htm>



Untreated wood items are prone to mold.

Mold removal and prevention

- Take precautions to avoid spreading spores
- “Do not disturb”
- High pressure hoses not recommended
- Sanitize surfaces
- Remove porous material if necessary
- Keep area well ventilated to prevent condensation



<http://www.factscolumn.com/facts-about-house-fly.html>

House Fly

Musca domestica Linnaeus, Muscidae, DIPTERA

Houseflies



- Breed in feces and garbage
- Eat organic matter (feces, garbage, liquids)
- Do not have chewing mouth parts
- Spit or vomit on solids in order to eat them
- Can carry typhoid fever, tuberculosis, *Cryptosporidium parvum*, dysentery, polio, anthrax, yaws, cholera, conjunctivitis, trachoma, and parasitic worms: tapeworm, hookworm, and pinworm.
- Can live 14 d. to up to two months

Houseflies



- Females can lay up to 500 eggs in 3-4 days
- Larvae need moisture
- New generation produced ea. 8 – 14 d. (opt.)
- pathogens commonly transmitted by house flies: *Salmonella*, *Shigella*, *Campylobacter*, *Escherichia*, *Enterococcus*, and *Chlamydia*.
- Implicated in the spread of over 30 bacterial and protozoan diseases. Ex: food poisoning, ophthalmia, and cryptosporidiosis

in dark and dry places

Fly Pupa

Barrel shaped resistant outer coating 5 - 6mm long



Breaks open after 6 days.



Adult Fly

6 - 7mm long with a wingspan of 13 - 15mm



Fly Egg

1mm long. Each female produces 600 - 900 eggs.

Eggs land on decaying food and faeces and hatch within 24

Fly Larvae

The larvae when fully grown are around 10 - 11mm long



Larvae found in dark and damp places filled with pathogens

<http://allspmnotes.blogspot.com/2012/12/science-form-5-notes.html>



Adult and eggs of the house fly, *Musca domestica* Linnaeus. Photograph by Jerry F. Butler, University of Florida.



<http://blogs.thatpetplace.com/thatreptileblog/2010/03/08/houseflies-and-maggots-as-food-for-reptiles-amphibians-and-invertebrates/>

“Maggots, Michael. You’re eating maggots. How do they taste?”

Cockroaches



- Can produce several thousand offspring per year
- Prefer food, warmth, and moisture
- Hide in cracks, crevices, drains, sewers
- Produce allergens
- Around for 300 million years
- Fastest running insect (~1 ft/sec.)
- Mechanically transmit pathogens

Ants/Flies/Rodents/Roaches

- Keep garbage containers covered - especially in the bathroom!
- Promptly dispose of organic garbage.
- Remove food sources; keep storage bins tightly sealed.
- Clean up spills as soon as possible.
- Avoid vacuuming or hosing down feces or dead critters; pick-up is best, followed by sanitizing.
- Sanitize equipment before use!

References

- <http://www.cdc.gov/mold/faqs.htm>
- http://www.cdc.gov/nceh/ehs/Docs/Pictorial_Keys/Cockroaches.pdf
- http://www.cdc.gov/nceh/ehs/Docs/Pictorial_Keys/Flies.pdf
- <http://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfcfr/CFRSearch.cfm?fr=178.1010&SearchTerm=sanitizing>
- <http://www2.ca.uky.edu/entomology/entfacts/ef614.asp>
- <http://www.uky.edu/Ag/Entomology/ythfacts/bugfun/trivia.htm>
- **1 NYCRR PART 2 REQUIREMENTS FOR THE PRODUCTION, PROCESSING, MANUFACTURING AND DISTRIBUTION OF MILK AND MILK PRODUCTS**
- <https://edis.ifas.ufl.edu/fs077>
- http://ipm.ncsu.edu/AG369/notes/house_fly.html
- Graczyk TK, Fayer R, Cranfield MR, Mhangami-Ruwende B, Knight R, Trout JM, et al. Filth Flies Are Transport Hosts of *Cryptosporidium parvum* [letter]. Emerg Infect Dis [serial on the Internet]. 1999, Oct [date cited]. Available from <http://wwwnc.cdc.gov/eid/article/5/5/99-0520.htm>
- <http://iknowfacts.wordpress.com/2010/02/>
- <https://edis.ifas.ufl.edu/fs077>
- http://entomology.ifas.ufl.edu/creatures/urban/flies/house_fly.htm