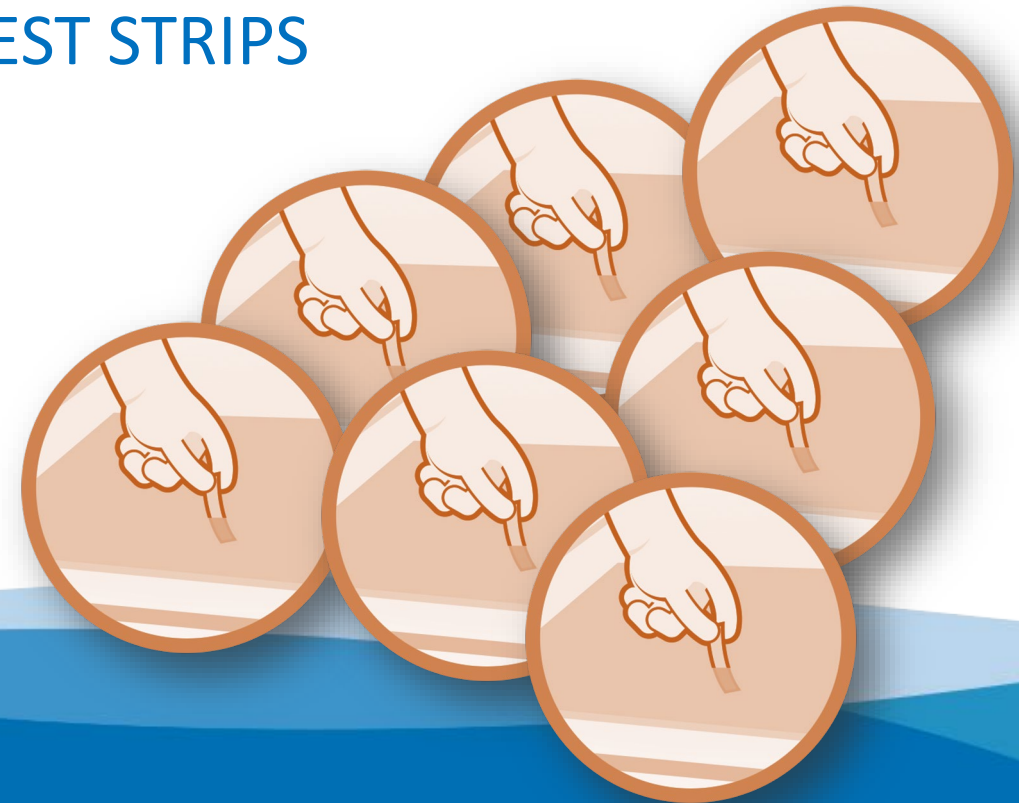


Sanitization for Food Safety

USING SANITIZER TEST STRIPS

Melissa Vaccaro
Vice President of Consulting
Paster Training Inc.
melissa.vaccaro@pastertraining.com
610-970-1776





Honor Wall of real-life victims of foodborne illness. Stopfoodborneillness.org

Welcome

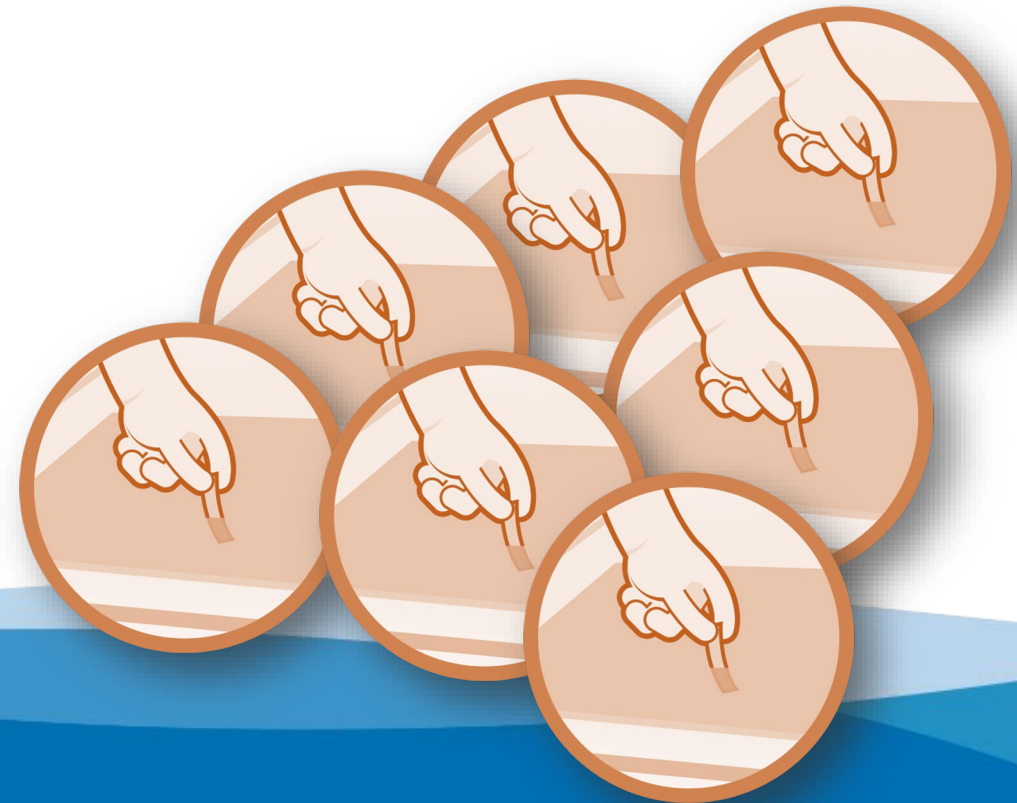
TRAINING OUTLINE

1. The Who
2. The Why
3. The What
4. The Where
5. The When
6. The How
7. Practice and Quiz



The Who

1. Us: Micro Essential Laboratory, Inc. and Paster Training, Inc.
2. The Regulator - Federal, State, Local
3. Industry - Retailers



The Why

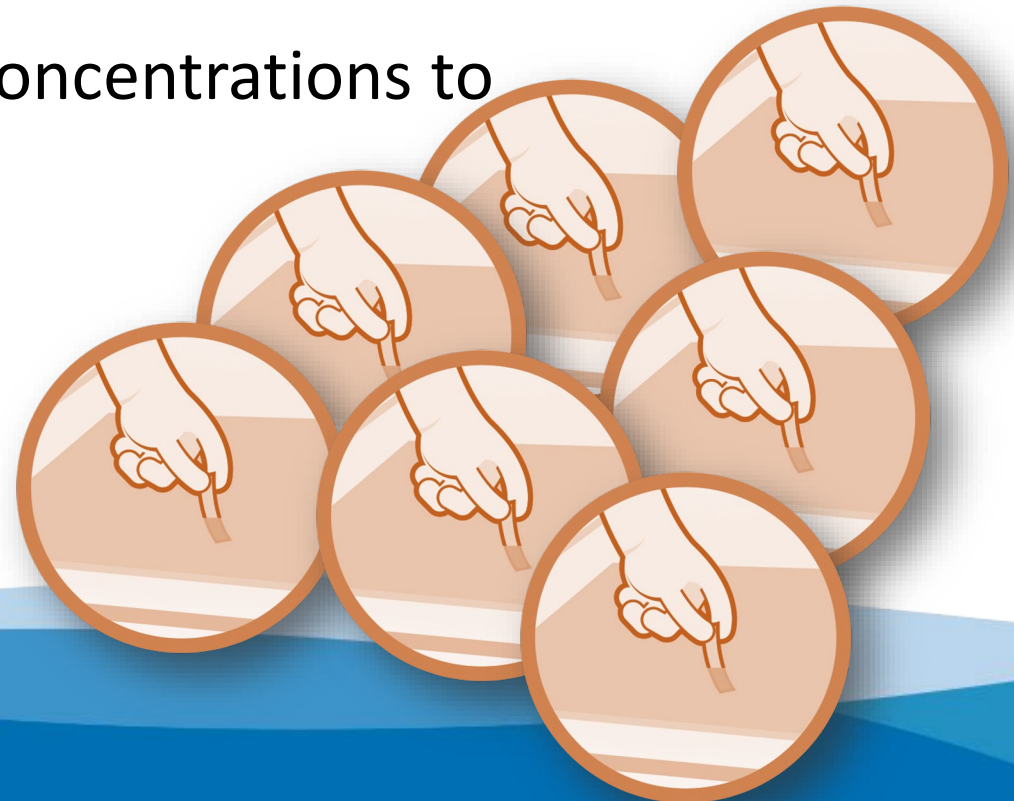
- ✓ To prevent, eliminate or reduce pathogens to a safe level.
- ✓ To protect public health and prevent foodborne illness.
- ✓ Regulations

1. Chemical sanitizers require minimum concentrations to ensure proper sanitization.

(Food Code § 4-501.114)

2. Too much sanitizer could be toxic.

(Food Code § 7-204.11)

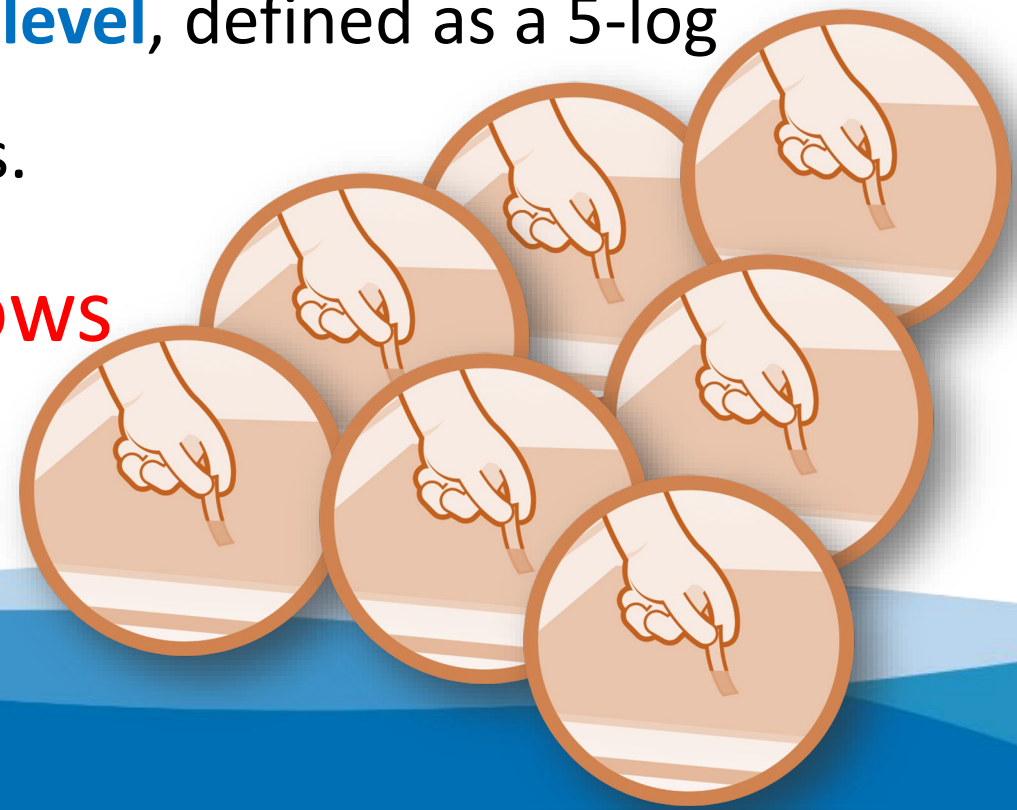


The What

Cleaning-the removal of dirt, food, or other soil from a surface, usually accomplished by a detergent

Sanitizing-the **removal of pathogens to a safe level**, defined as a 5-log reduction, or removal of 99.999% of organisms.

Sanitizing only works when it follows proper cleaning!!





The What

Disinfection- eliminates **nearly all recognized pathogenic microorganisms** **but not necessarily all microbial forms** (e.g., bacterial spores) on inanimate objects.

Sterilization- is a procedure that **kills all microorganisms**, including high numbers of bacterial endospores. Sterilization can be accomplished by heat, ethylene oxide gas, hydrogen peroxide gas, plasma, ozone, and radiation (in industry).



The What

Temperature Sanitization (Heat Sanitizing) in retail food facilities is accomplished by:

- ✓ Hot water manual operations by immersion at temperature of 171°F (77°C) for at least 30 seconds.
- ✓ Hot water mechanical operations by being cycled through conveyor warewashing equipment at a temperature of 180°F (82°C.). This manifold temperature which will yield a plate temperature of 160°F or above.

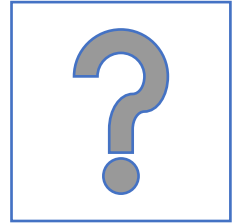


The What

Chemical Sanitization- Manual or Mechanical

- ✓ **Chlorine**
- ✓ **Quaternary Ammonium Compounds (Quats)**
- ✓ Iodine
- ✓ Other

The What



CHLORINE

Concentration Range (ppm)	Minimum Temperature pH 10 or less	Minimum Temperature pH 8 or less
25-49	120°F (49°C)	120°F (49°C)
50-99	100°F (38°C)	75°F (24°C)
100	55°F (13°C)	55°F (13°C)

The What



As pH increases, chlorine becomes less effective as a sanitizer.

- Chlorine itself is a strong base – has a high pH (7 – 14)
- **If the pH of the solution is high or basic, chlorine won't "react"**
- It takes a lower pH, more of an acidic environment, to get the chlorine to react in the water and actually do what we want it to do; that is, sanitize

The What

Chlorine

- ✓ **IS** effective for most bacteria, viruses, fungi, and bacterial spores
- ✓ **IS NOT** the best choice to breakdown organic matter and biofilms (groups of microbial cells held together by a kind of cellulose; basically microbial slime). These require scrubbing, acidic cleansers, and quats.

The What

QUATERNARY AMMONIUM COMPOUNDS

1. Surfactant and Sanitizer

2. 2-Chain quats

Shorter chain

Second generation

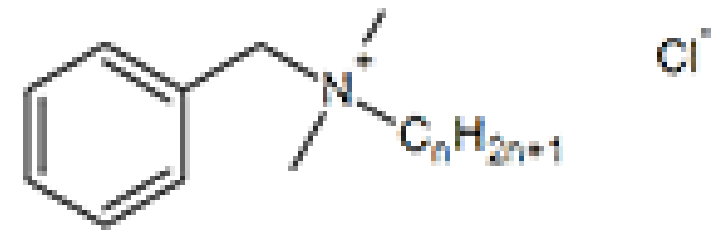
Exact measurement, 200ppm

3. 4-chain quats

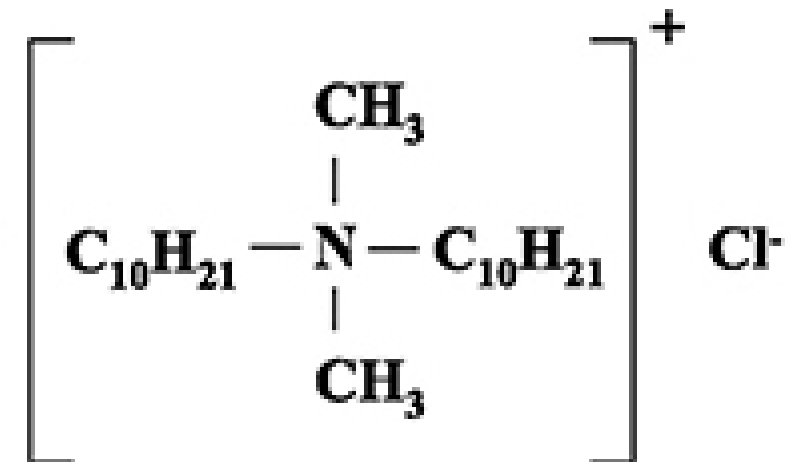
Longer chain

Fourth generation

Broad range of measurement, 150-400ppm



$n = 8, 10, 12, 14, 16, 18$





The What

QUATS MUST:

1. Be **tested** at a temperature of 65°F - 75°F (18°C - 24°C) for greatest accuracy (this may not be the same as the “use” temperature.)
2. Have a concentration as specified under the FDA Food Code § 7-204.11 and as indicated by the manufacturer’s use directions included in the labeling
3. Be used only in water with **500 MG/L hardness or less** or in water having a hardness no greater than specified by the EPA-registered label use instructions because the **surfactant makes the quat more sensitive to water hardness levels.**



The What

QUAT BINDING:

If a cloth is soaking in solution, there may not be enough sanitizer for it to be effective in reducing the number of pathogens.

- Quats bind to fabrics (microfiber cloths bind less than cotton)
- Sanitizer is “in the fabric” no longer in the solution
- Leads to an ineffective level of sanitization on the surface/equipment
- The Quat solution need to be tested just prior to use



The What

When using quats, it is important to ...

- ✓ Spray, wipe around lightly and air-dry,
- ✓ dip and air-dry, or
- ✓ soak an item to be sanitized in a solution that has been tested and confirmed to be at the correct concentration. Then air-dry.



The What

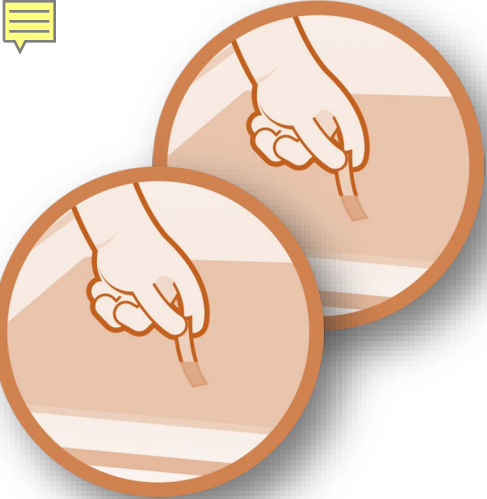
SOLUTION	PROS	CONS
Chlorine	Highly effective on a wide variety of bacteria, inexpensive, and not affected by water hardness	Corrosive and irritating to the skin, effectiveness depends on solution pH and exposure to light; loses effectiveness with biofilms/organic matter, requiring more frequent water changes
Quats	Nontoxic, odorless, colorless, noncorrosive, nonirritating, effective over a wide pH range and with organic matter, heat stable	Works slower than chlorine, temperature sensitive, ineffective with hard water and some detergents



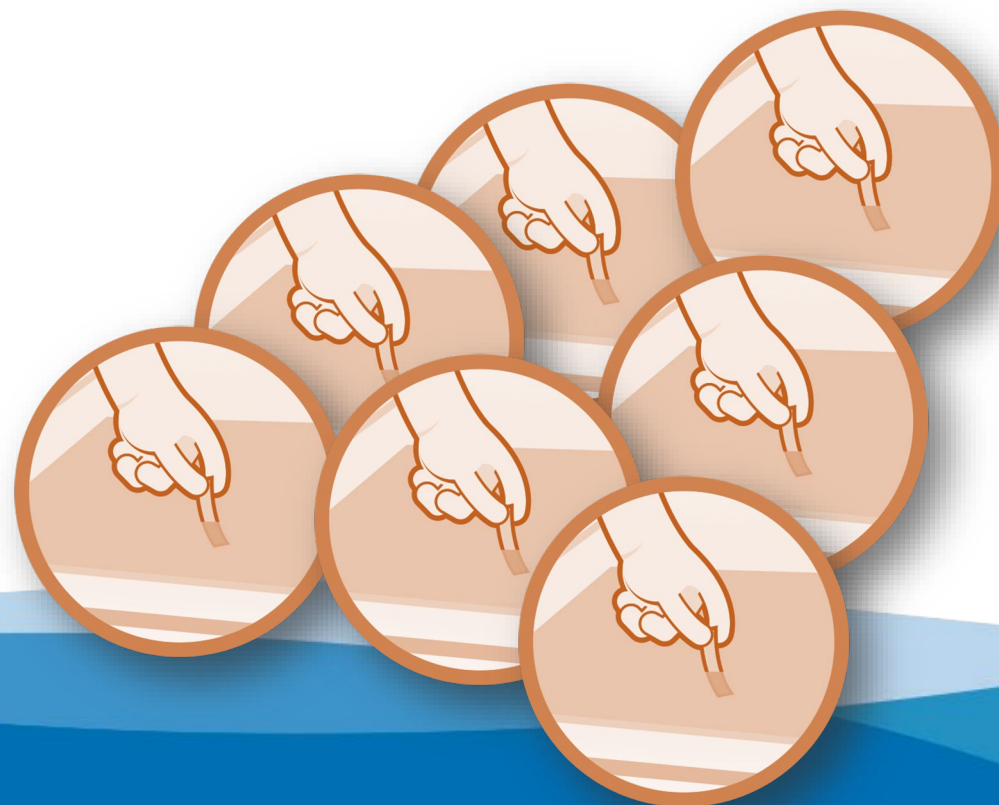
The What

TEST KITS

1. **QT-10**, or “Quat Test – 10” is formulated for 2-chain quat compounds with measurements in the range of 0 - 400ppm.
2. **QT-40** is a quat test paper for 4-chain quats with measurements of 0 - 500ppm.
3. **QAC** is a general, non-specific match to test for all quats.
4. **Chlorine** test papers provide a means to measure the concentration of free available chlorine in solution. Measurements range from 10 - 200ppm.



Exercise



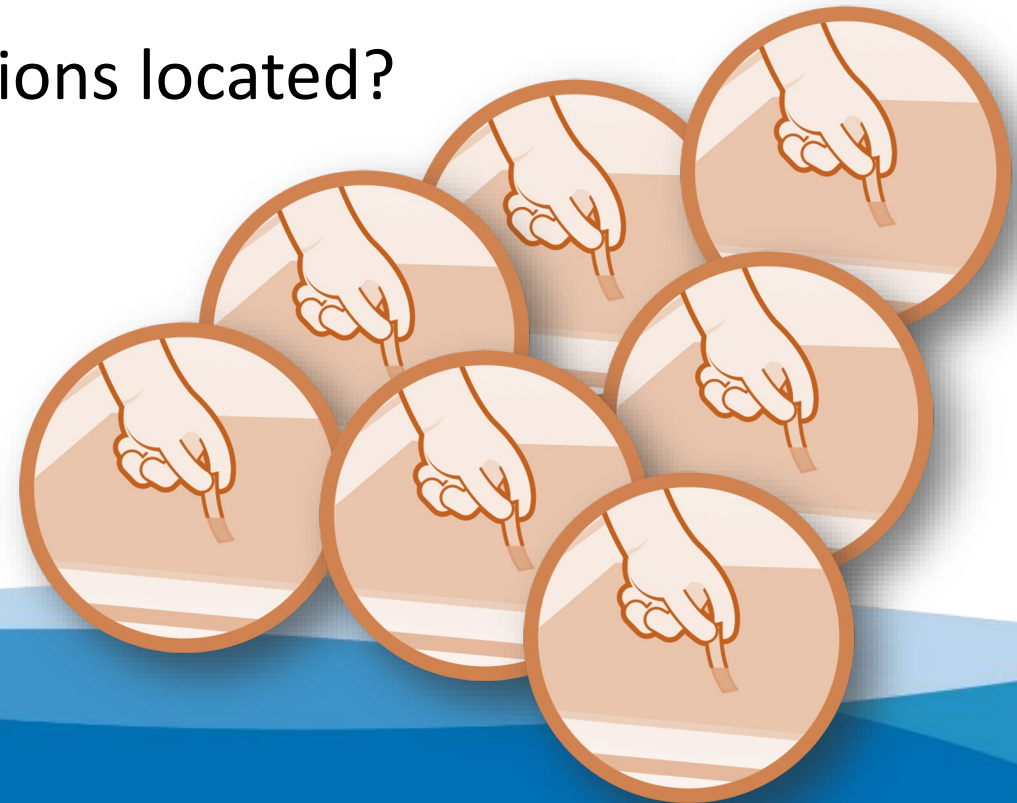


Exercise

- | | | |
|------------------|----|---|
| 1. QT-10 | 5 | Concentration based on temperature and pH |
| 2. Quat | 6 | Test paper used for 4-chain quats |
| 3. Sterilization | 9 | Minimum water temperature for quat |
| 4. Cleaning | 10 | General, non-specific test for all quats |
| 5. Chlorine | 7 | Decreases pathogens to safe levels |
| 6. QT-40 | 2 | Breaks down biofilms |
| 7. Sanitizing | 1 | Test paper used for 2-chain quats |
| 8. Quat binding | 8 | Sanitizer remains in cloth, doesn't transfer to surface |
| 9. 65°F (18°C) | 4 | Removes dirt and soil |
| 10. QAC | 3 | Kills all microorganisms in their natural state |

The Where

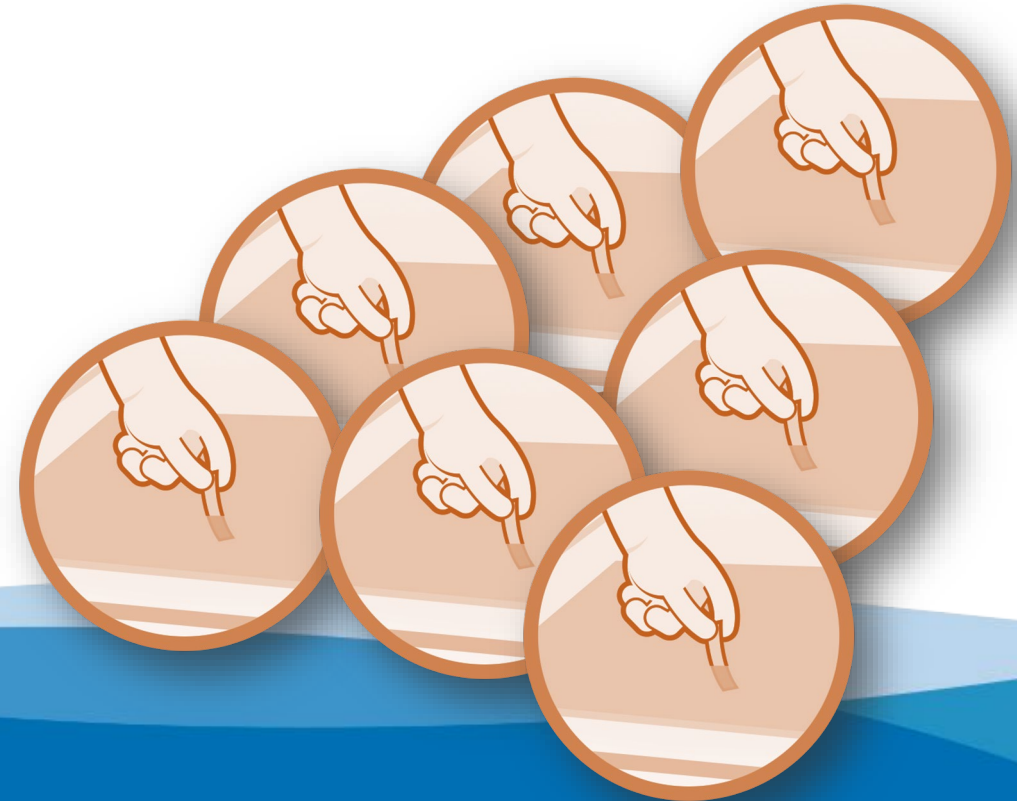
1. Which types of facilities use sanitizers? Which sanitizers to they typically use?
2. Where, within a facility, are sanitizer solutions located?





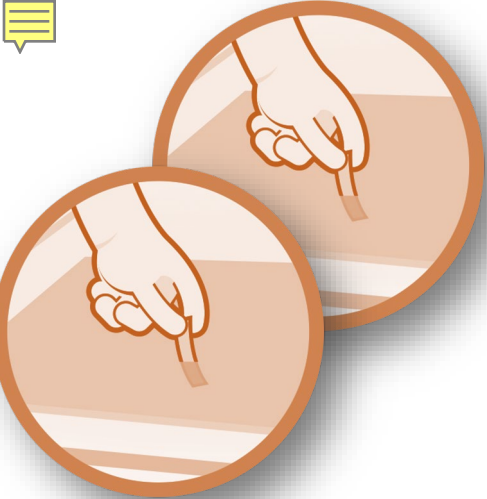
The When to Test

1. Buckets= Every 2 to 4 hours or more as needed to keep the water clean and the sanitizer effective in use.
2. Spray Bottles-1 time/day at minimum
3. Dishmachines- 1 time/day at minimum
4. Pre-soaked disposable sanitizer wipes- Each new wipe or after extensive use.

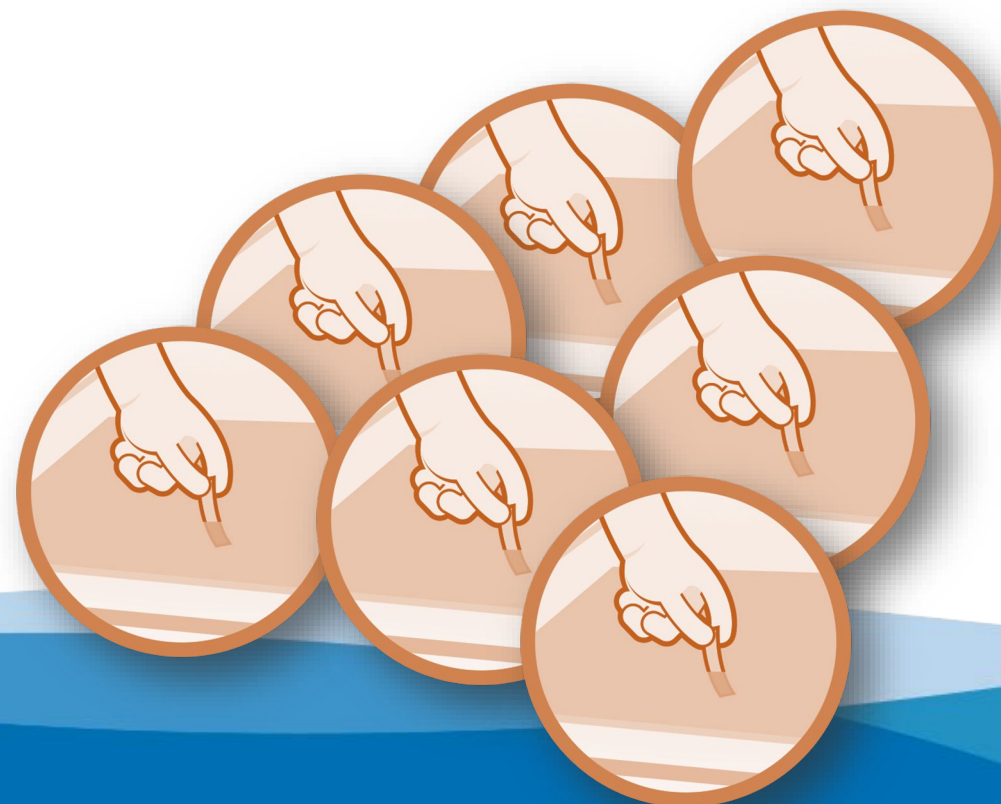




The When



The How





Watch
and
Learn!

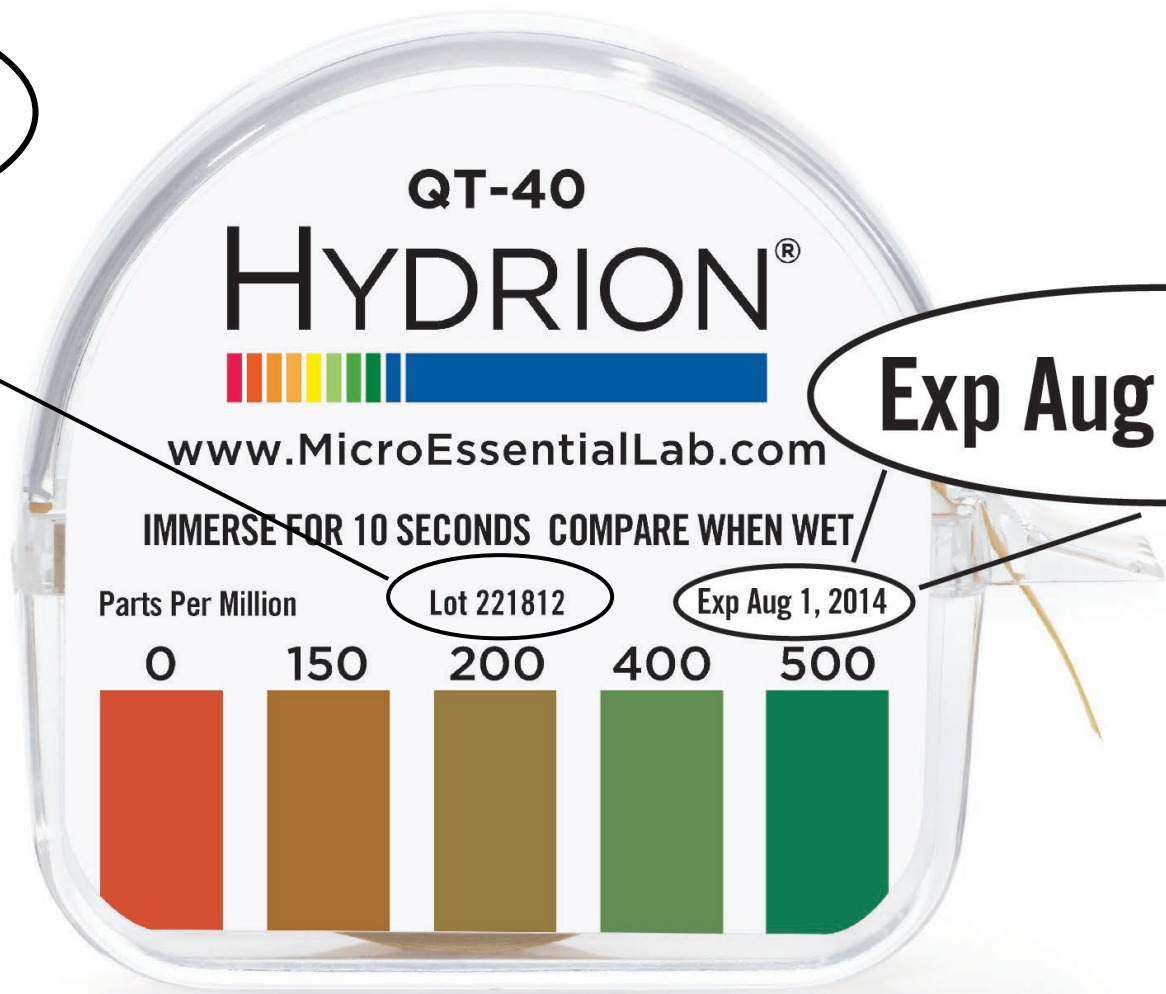
The How



The How



**Lot Number
221812**



Exp Aug 1, 2014

The How



The How



The How



The How



The How

Follow instructions on kit:

1. Water temperature for TESTING
2. Foam and swishing
3. Time
4. Blotting
5. Color chart
6. Reading the results



The How – Quat Testing



No testing bubbles!
No swishing the strip around!

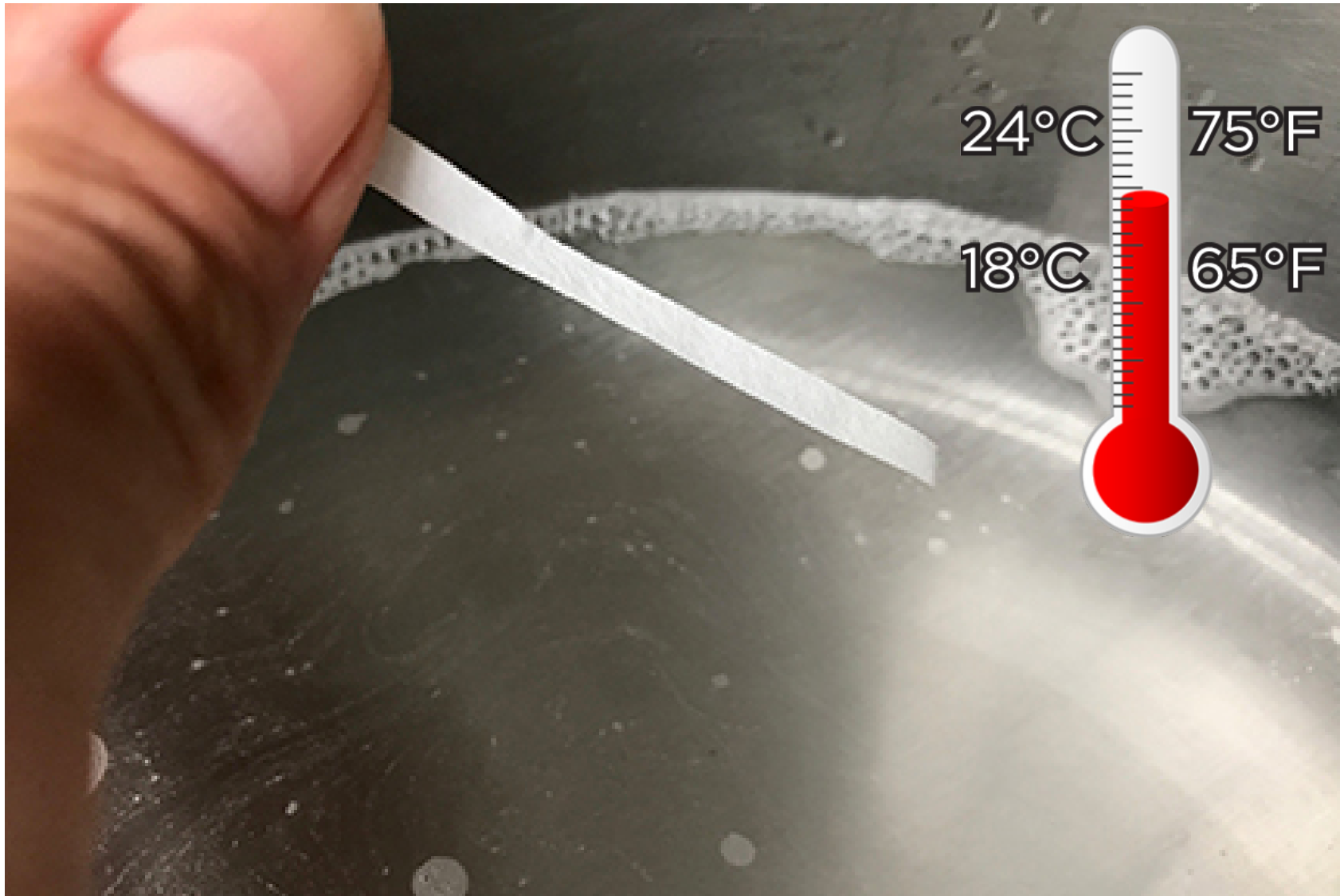
The How - Quats



The How – Quats



The How - Quats



The How – Chlorine Testing



The How - Chlorine



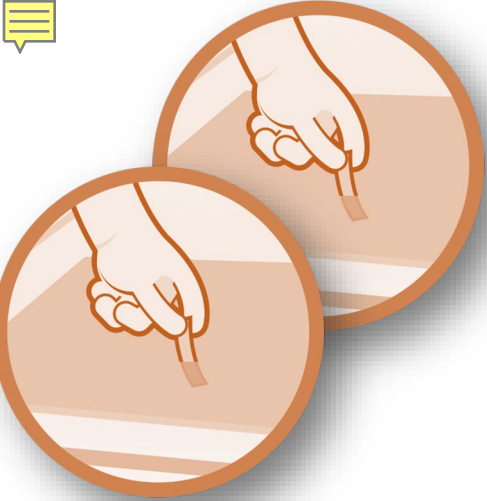
The How - Chlorine



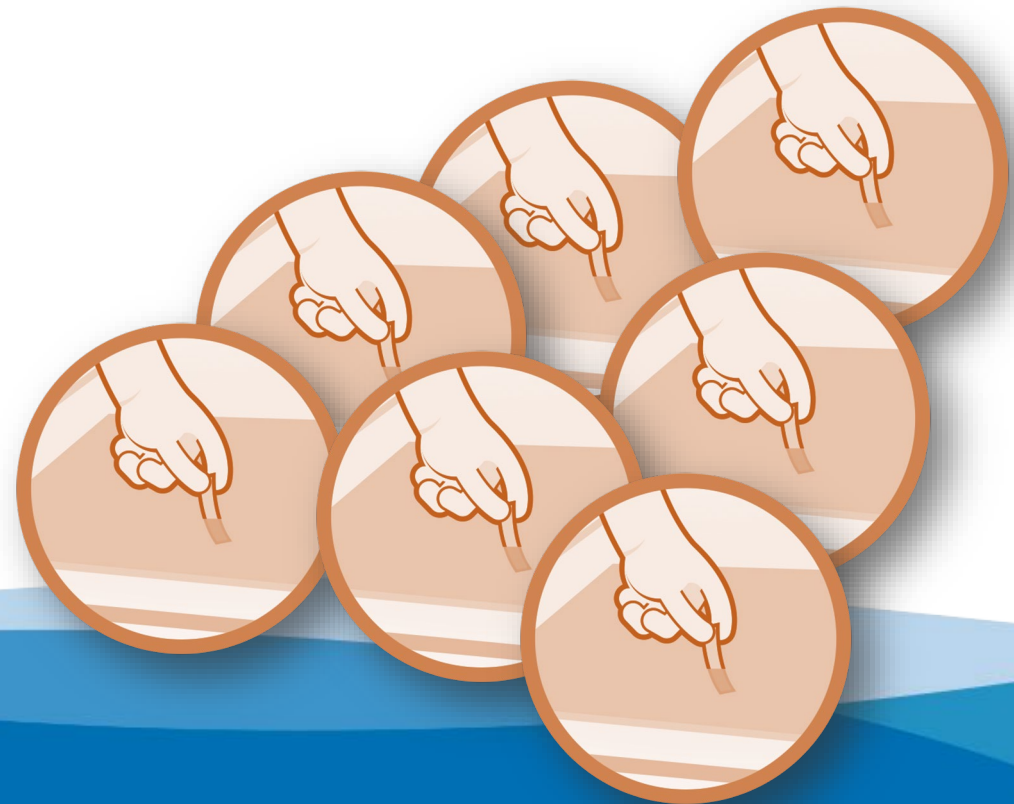
The How - Chlorine



The How



Exercise





Exercise

1. Which sanitizer is ineffective in hard water? Quats
2. Why would a test kit not have an expiration date? Old, made prior to expiration dates
3. What is the problem with a low sanitizer concentration? Might not be effective
4. Why is it important to let foam dissipate prior to testing a quat? Foam has a higher concentration of the quat and will give a false reading
5. When testing quats, the temperature of the solution should be Approximately room temperature -or- 65°F - 75°F (18°C -24°C).
6. How can someone tell which sanitizer test kit to use for their solution? Read the label; same as the sanitizer used
7. Which sanitizer is affected by the pH of a solution? Chlorine
8. What is the average concentration of chlorine in a bleach and water solution for sanitization? 50 - 100ppm
9. The test strip should be swirled in the sanitizer solution to be able to get a reading in different areas. T / F
10. All test strips should be dipped into solution and removed immediately. T / F



Demonstration



You Tube- Micro Essential Lab

https://www.youtube.com/watch?time_continue=6&v=SHBCMfk-bfo

We thank you for protecting public health!



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We Educate. We Lead. We Impact.[®]

Melissa Vaccaro
Vice President of Consulting
Paster Training, Inc.
25 Swinehart Rd – Gilbertsville, PA 19525
melissa.vaccaro@pastertraining.com
610-970-1776

MICRO ESSENTIAL
LABORATORY
Hydrion[®] pH and sanitizer test kits since 1934

Rob Lynch
Sales Manager
Micro Essential Laboratory, Inc.
4224 Avenue H • Brooklyn, NY 11210
rob@microessentiallab.com
718-928-2913