How to apply quantification of cleaning, sanitizing and disinfection to field inspections.

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Human Biome

- Bacteria in and on a human body weigh about 4 pounds or could fill a half-gallon jug.
- The bacterial cells outnumber human cells 10 to 1, but account for only 1 to 2 percent of our body mass.
- Bacteria make up about half of our body waste.

Don't believe everything you believe!

Misconceptions

Understanding the differences between the dynamics of

Cleaning

Sanitizing

Disinfecting

Question #1

Which is the most important?

Cleaning?

Sanitizing?

Disinfecting?

Question #2

Which chemical solution is a better cleaner?

Disinfectant?

Detergent?

Question #3

Which is a better cleaning agent in a food service environment?

Sodium hypochlorite?

Sodium hydroxide?

Question #4

Which cleaning method would be more effective in lowering the risk of microbiological contamination?

Clean Rag and fresh sanitizer bucket?

Clean rag and clean detergent solution?

Question #5

Which poses a **<u>higher</u>** risk of microbiological contamination?

Rag and sanitizer bucket?

Dry clean rag?

Question #6

Which is more important?

Wash cycle?

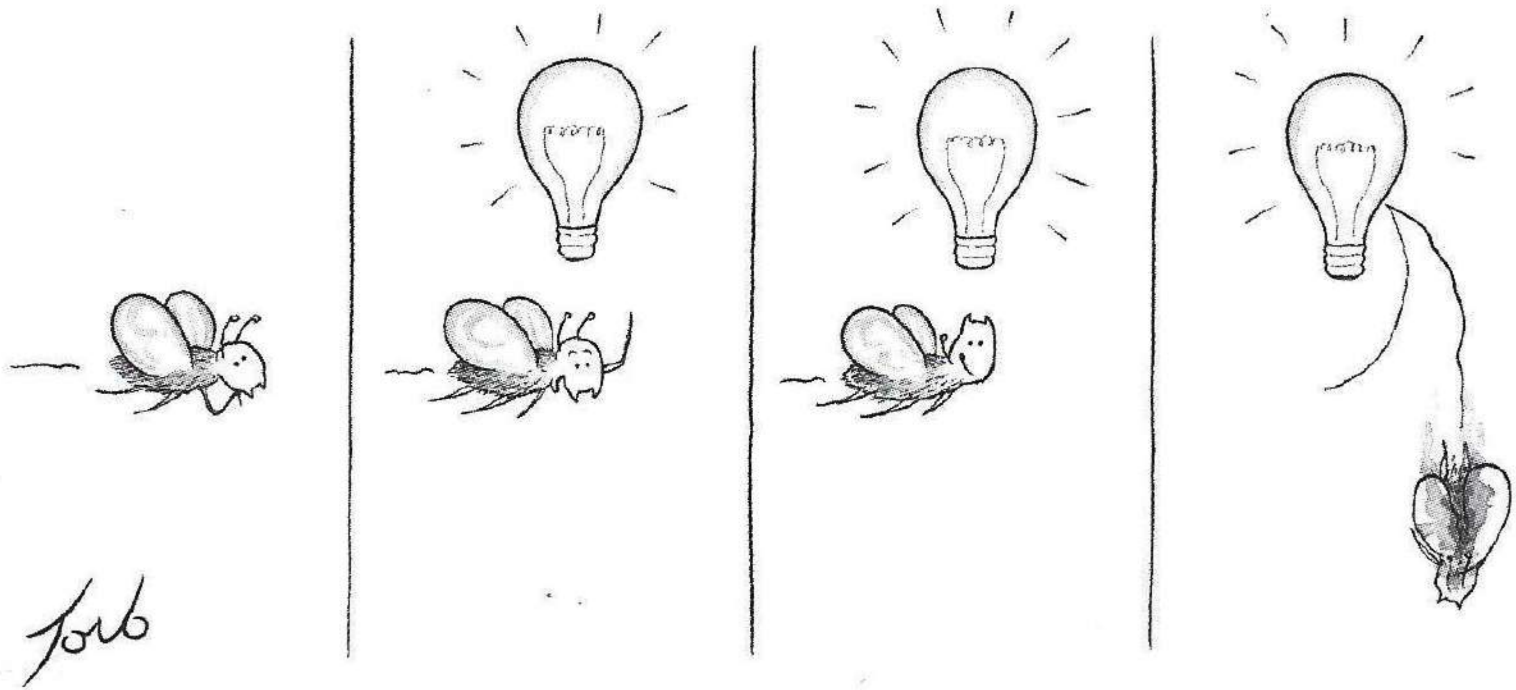
Sanitizing cycle?

Finally:

Can you
sanitize a turd?

Yes?

No?




HALF FULL.
HALF EMPTY.
OPTIMIST
PESSIMIST
11-6
© 2012
speedbump.com
CREATORS
PRAGMATIST

A Pragmatist's Meme

- A visibly soiled surface cannot be properly disinfected (or sanitized). A disinfectant is made to kill viruses, fungi, and bacteria through direct, sustained contact. Other organic compounds can limit or completely prevent disinfection from taking place.
- It's always better to remove than try to kill. That's why all microbiocides say "Kills 99.9% of germs" or something similar. If you remove the germs, you don't need to worry about killing them.

More Meme

- Cleaners and disinfectants need to be separate products. A cleaner/disinfectant cannot thoroughly disinfect a surface since the detergents in the cleaner can make the disinfectant less effective.
- Cleaning is a quick process that requires scrubbing, wiping, or some other type of agitation. Disinfecting is a slow process that requires dwell time. Some disinfectants require that the surface should be visibly wet for over 10 minutes. Sanitizing takes 30 seconds.

Cleaning


Sometimes, even if I stand in the middle of the room, no one acknowledges me.
Facebook.com/BizarroComics
9-2-12
BIZARROCOMICS.COM


Typical Scenario

Cleaning can be Measured Objectively

Measuring “Clean”

- Aesthetically clean: “Clean to sight and touch”
  - Highly subjective
  - Biased
- Presence of inorganic soil and fats
  - Less bias, but still somewhat subjective.
  - Uses a +/- gradient
- Biological cleanliness
  - Measurable in orders of magnitude
  - Objective

Quick Definitions

- Bioload:

  An estimate of the number of microorganisms on an object.

  Best guess estimate

- Bioburden:

  The actual number of microorganisms with which an object surface is contaminated.

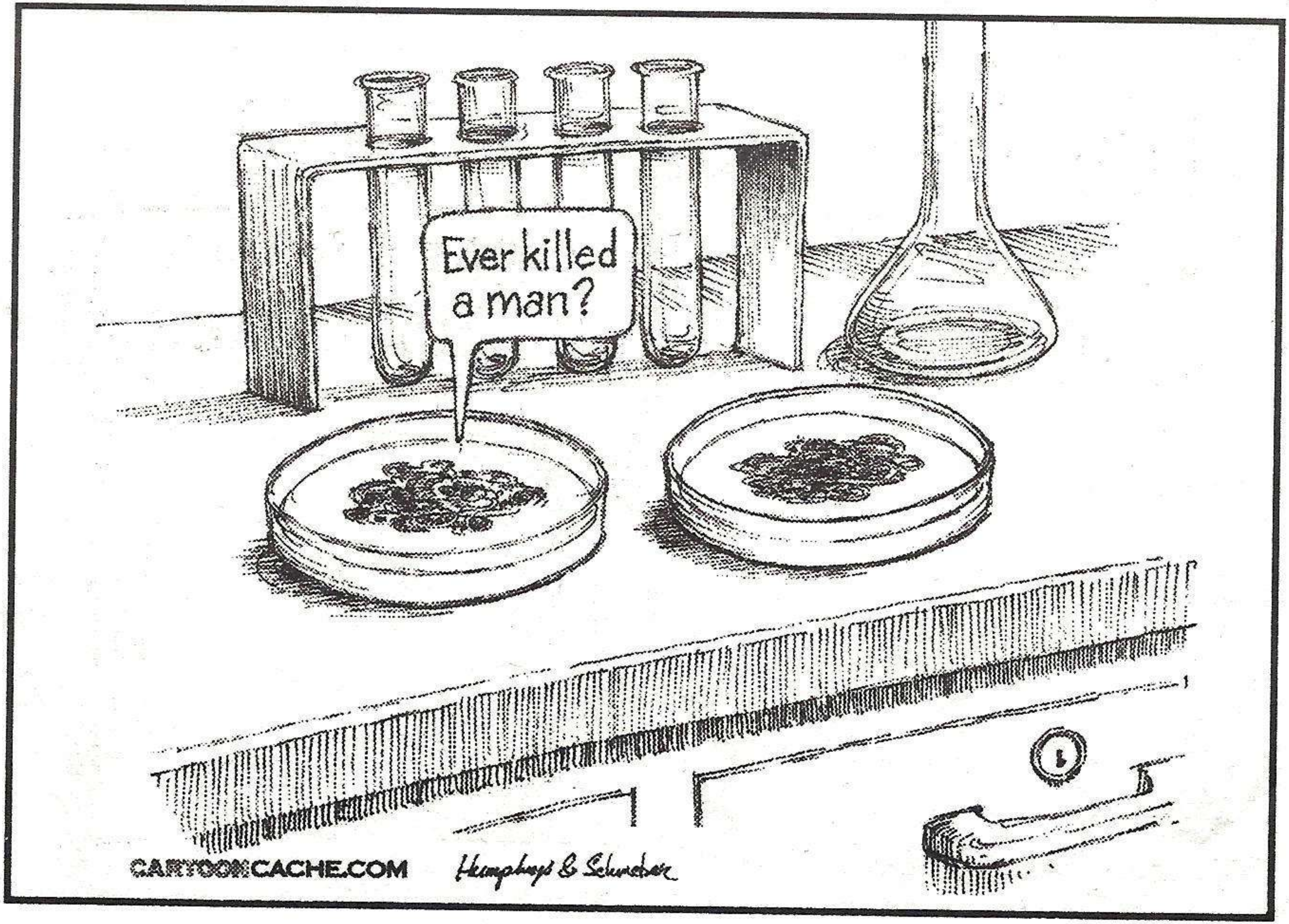
  Determined by measurement

Cleaning Objectives

1. Aesthetics (visibly clean) = subjective.
2. Health (Infection Prevention and Control).
3. **Contamination Control (Product Protection)**
4. Safety (Injury Prevention Cleaning Objectives)

Principles of Contamination Control - Hierarchy

1. Keep contaminants out .
2. Get rid of the ones that get in.
3. Prevent damage from those that have gotten in.
4. Minimize their movement.


Ever killed a man?
CARTOONCACHE.COM
Humphreys & Schreiber

Quick Definitions

Disinfection: medical

Completely destroys all specific test organisms in 10 minutes under conditions of the AOAC Use Dilution Test: Probability: $P=(\geq 10^{-6})$

Sanitization: public health

Destroys 99.999% (10^{-5}) of specified test bacteria in 30 seconds under conditions of the Official Detergent Sanitizer Test (Weber & Black).

A word of caution …

Most disinfectants and sanitizers must comply with the provisions of the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA).

There are exceptions: Hypochlorous acid HClO (<200ppm); Steam (~160°C); Hydrogen peroxide (35%) H_2O_2; Ozone O_3; Acetic acid CH_3COOH (10%).

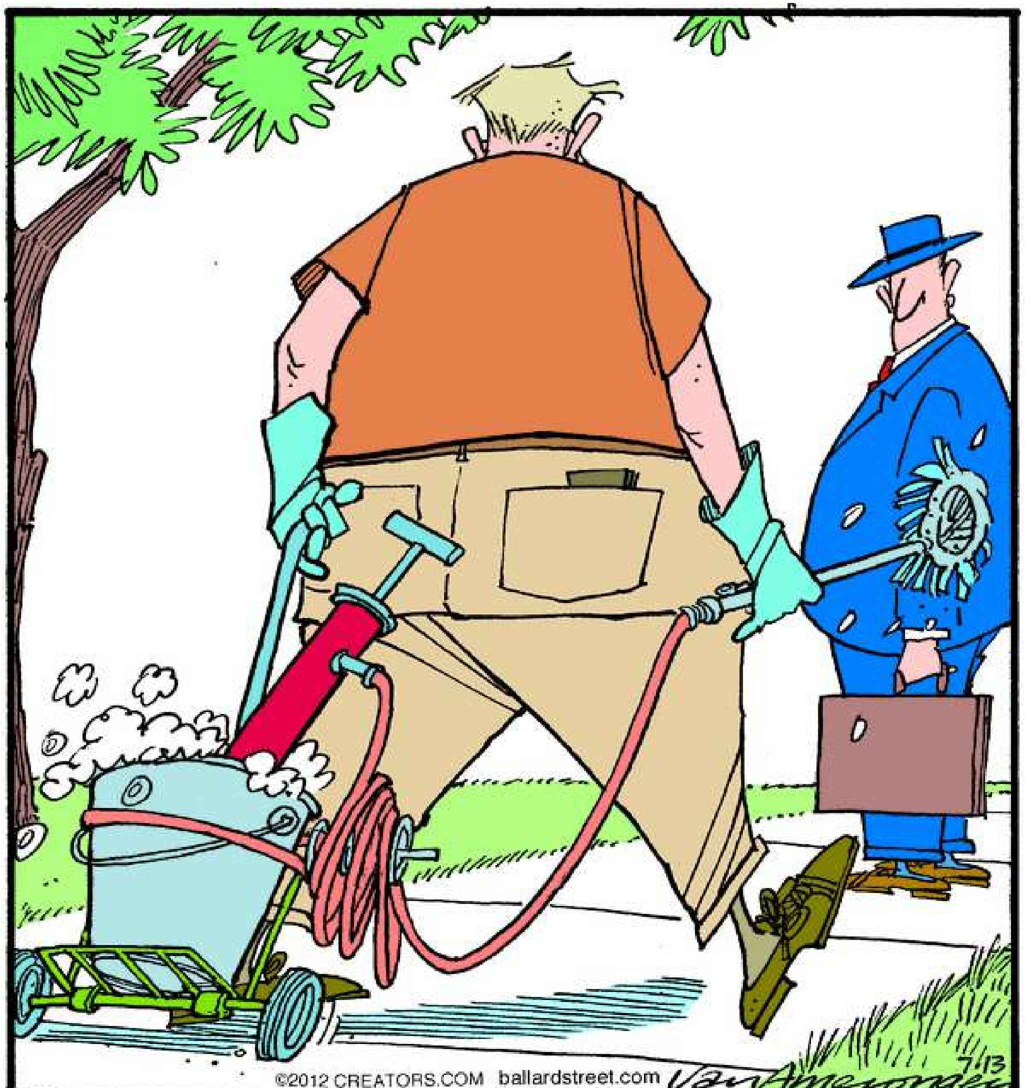
It is both prudent (public health) and practical (economics) to minimize use of toxins, and, reduce the bioburden as much as possible.

FCSSM User Guide (2017)

The Food Contact Sanitizing Solutions Model (FCSSM) was developed to estimate indirect dietary exposure to components of sanitizing solutions used in commercial settings.

https://www.epa.gov/pesticide-science-and-assessing-pesticide-risks/fcssm-user-guide-and-supporting-documents

HOW CLEAN IS CLEAN?



Chuck believes he's located another person needing "tidying up."

Reducing contamination level of objects and environment.

Priority 1: Sterility required.

Priority 2: Removal of pathogens, lowest possible level of other microorganisms (disinfection).

Priority 3: Reduction of microbial numbers to levels considered “safe” (sanitization).

Priority 4: Aesthetic cleanliness.

Ranking the risk within the environment.

Priority 1: Food contact surfaces.

Priority 2: Common touch surfaces and touch points.

Priority 3: Everything else above the floor.

Priority 4: Floor (safety).

Reducing contamination in the environment.

Priority 1: Removal of pathogens, lowest possible level of other microorganisms.

Priority 2: Reduction of microbial numbers to levels considered “safe”.

Priority 3: Aesthetic cleanliness.

- No growth
- Preventing foul odors


Not a morsel of food in the entire place.
Dist. by King Features
© Dan Piraro 10.5.13
ROACH HELL
BIZARROCOMICS.COM Facebook.com/BizarroComics

Sanitation Inspection Tools

Measuring devices for physical cleanliness

Determining “*Clean to Sight and Touch*”

LED flashlight with focused beam

Ultra Violet (UV) flashlight – 390nm (3900Å)

Wooden cotton swabs

Alcohol swabs

Clear cellophane tape / magnifying glass

Measuring chemical cleanliness

Determining Solution and Surface Chemistry

pH - Measure change before and after cleaning.

Flat probe, Paper Test Strips and pH test solutions

Sanitizer indicator papers

Chlorine and Quaternary Ammonium Chloride

Spot Tests - Color change indicators (+/-)

Poly/Dyne Quick Check pen –

wetting and surface tension

Monitoring biological cleanliness

Determining Bio-contamination

RODAC® Plates (Replicate Organism Detection And Counting)

Direct contact on flat or slightly rounded surfaces

Incubate at ambient temp, then at 36°C.

Swabs and wipes - For use on uneven surfaces.

Monitoring biological cleanliness

Determining Bio-contamination

ATP swabs: Adenosine triphosphate

Range of detection accuracy on standard plate count: 25-30 to 250-300 CFU on a standard Petri dish is statistically accurate.

Inspection kit

ATP Monitoring System

ATP Monitoring Devices

ATP monitors detect all materials of plant or animal origin, including bacteria and fungi.

- Therefore, ATP detects everything; it is a **"dirt test".**
- Clean surfaces show low levels of total ATP. On the low end of sensitivity, most test kits will detect an equivalent to about 1,000 bacterial cells.
- It is therefore safe to assume that light output (in the luminometer) greater than 2 to 3 times background of a clean surface, indicates that the area tested is contaminated with biological material.

ATP Monitoring Devices

What it is and what it does:

- The monitoring device consists of a swab, reagent and a luminometer.
- ATP reacts with two firefly enzymes that produce light:
  - Luciferin and Luciferase
- Data are displayed as RLU (Relative Light Units).
  - The more photons, the greater the light output;
  - The greater the light output, the greater the potential biological contamination.

Interpretation of ATP data

Each situation serves as its own control.

- Develop "before" and "after" trending:

  Integrated Cleaning and Measurement (ICM).
- Develop "target" patterns.
- Finite numerical outcomes are unfeasible.
  - Relevance: only orders of magnitude.

Finally,

- Always follow scientific sampling methodology.
  - ANSI/ASQ Z1.4 – 2003
  - MIL-STD-105E
  - APHA: "Compendium of Methods For the Microbiological Examination of Foods"
- Encourage data sharing.
- Never use data punitively.

Conclusion

Understanding the science and role of cleaning as a primary method of microbial control; followed by effective use of a biocidal agent will optimize efficacy and safety.

Assigning cleaning priority levels along with simple subjective observations of physical cleanliness, in addition to basic objective monitoring for biological reduction will minimize contaminants as well as the use of toxins.


KEEP
CALM
IT'S
THE END OF
PRESENTATION

Questions,

Comments,

Brickbats?