



Episode 3: Clean vs Sanitize vs Disinfect

So What about Clean, Sanitize, Disinfect, what are the differences?

Clean

The physical removal of foreign material (e.g., dust, soil) and organic material (e.g., blood, secretions, excretions, microorganisms).

Cleaning physically removes rather than kills microorganisms.

Sanitize

Non-food contact surfaces

Removal/reduction in microorganisms by 3 log

Food Contact surfaces

Reduction in microorganisms by 5 log

Disinfect

Inactivation of disease-causing microorganisms

Are there different disinfect levels?

Low level disinfection

Kills many microorganisms, including blood borne pathogens like HIV, but not tuberculosis, nor some harder to kill viruses (Norovirus [vomiting and diarrhea], Rhinovirus [colds], Hepatitis A)

This is considered 'hospital disinfectant' (CDC 2008)

Intermediate level disinfection

Kills Tuberculosis and the harder to kill viruses

Not actually used much as a term

High Level disinfection

Destroys all bacteria and viruses, but not large numbers of spores



Explain 'log'.

Stands for Logarithm

Simply, how many of one number do we multiply to get another number?

For \log_{10} , $100=10 \times 10$, so the \log_{10} of 100 is 2, $10,000=10 \times 10 \times 10 \times 10$ so the \log_{10} of 10,000 is 4

We can use \log_{10} interchangeably with percent reduction if we like.

Percent reduction, is that like 99.9%?

99.9% of germs killed! (3 nines listed – 3 log).

99.999% (5 nines listed – 5 log).

For large numbers

remove zeroes according to the number of nines

move the decimal point to the left by the log 'number'.

For example:

99.9% kill of 1,000,000 organisms = 1,000 organisms still present.

99.999% kill of 1,000,000 organisms = 10 organisms still present!

Is there a Log Reduction value for Cleaning, Sanitizing and Disinfection?

Cleaning is a standard of hygiene, not a measure of antimicrobial activity

Sanitizing leaves viable pathogens, but kills a significant portion of the pathogens present on cleaned surfaces

Disinfection implies a high level of kill for the bugs tested

What about store brands, what do you think of those?

Sanitize (99.9% of germs (3 \log_{10})) Disinfect (99.999)

Most labels will indicate 4 minutes

What about 'Cold and Flu viruses' on the label?

Brand 1: Influenza A (7 Strains), Parainfluenza, Hepatitis B & C, HIV (Blood borne pathogens), Ebola, Coronaviruses (MERS, SARS), RSV, Rotavirus (4 minutes)

Brand 2: Herpes Simplex Virus Type 1, Human Coronavirus, Influenza A Virus, Respiratory Syncytial Virus
Neither of these store bought brands will kill Norovirus (vomiting and diarrhea) or Rhinovirus (causes ~50% of colds every winter), so this is an issue if store-brand products are used in long term care, or schools.

Summary

Do you need to clean or disinfect?

Is 99.9% good enough?

Is your consumer brand good enough if you are worried about hard to kill cold virus or vomiting and diarrhea virus?