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 = 10x10, so the log_{10} of 100 is 2, 10,000 = 10x10x10x10 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?