

EFFECTIVENESS AGAINST E. COLI:

This organism is used as a standard test for the effectiveness of disinfectants against bacteria. Destruction of E. coli indicates that other bacteria which infect animals and spoil foodstuffs will also be destroyed. Please note that 120 times less chlorine in the form of hypochlorous acid (active ingredient in Sagewash) is needed than liquid chlorine (liquid bleach) to destroy bacteria.

Examples below are organisms that cause:

- Acute and chronic inflammation, i.e., mastitis and septic wounds (staphylococci and streptococci);
- Bacterial diarrheas (e.g., E. coli) in pigs and poultry;
- Salmonella which is a common cause of food poisoning, particularly in poultry products.

EFFECTIVENESS AGAINST B. METIENS SPORES:

A typical food spoilage organism that is very resistant to disinfection and heat. Please note that 40 times less chlorine in the form of hypochlorous acid is needed than hypochlorite ions to destroy the spores.

Also note the rapid destruction of the spores (20 seconds) at 750 ppm hypochlorous acid compared to 1000 ppm hypochlorite ion, which needs 70 minutes for complete kill. Spore-forming bacteria occur in soil and can be present in considerable numbers in dust.

Examples are:

- B. Cereus. This causes mastitis and is also frequently responsible for the spoilage of dairy products.
- B. Botulinum. This is responsible for very severe food poisoning in canned foods.

EFFECTIVENESS AGAINST VIRUSES:

Polio type 3 virus is one of the most resistant viruses and is also frequently used as a standard test for disinfectants. Note that 50 times less hypochlorous acid is required than hypochlorite ion for destruction of the virus. Viruses are extremely susceptible to even very low levels of free chlorine, as low as .02 ppm. In nature, however, they occur in close association with living cells and organic debris, which affords them protection.

Pressure spraying Sagewash with chlorinated water **rolls over** debris and thus exposes the virus to chlorine and destroys it. The destruction of organic material by chlorine results in a decrease in odor and reduces the presence of insects such as flies, which are known transmitters of viral diseases. **Particular applications here are for dog kennels (odor/parvovirus); hog pens (viral pneumonia); breeding areas; poultry houses, etc.**

(U.S.DA. reference source)

Biocidal Effect of Free Available Chlorine on Various Organisms (please note pH levels and concentration of chlorine)

<u>BACTERIA</u>	<u>pH</u>	<u>Temp. C</u>	<u>Time</u>	<u>PPM</u>	<u>Biocidal Results</u>
E. coli	7	25	1 minute	.055ppm	100%
M. tuberculosis	8.4	60	30 seconds	50ppm	100%
S. aureus (staph)	7.2	25	30 seconds	.8ppm	100%

VIRUSES

adenovirus 3	9	25	40 seconds	.2ppm	99.9%
poliovirus III	7	25	2 minutes	.2ppm	99.9%

* Please bear in mind that the concentration under test is in the 5th column. Sagewash creates a solution at **60ppm** (for example Polio virus would be eliminated in 1/300th of the 2 minutes quoted (4/10ths of a second)

Summary:

The tests above used the measure of Free Available Chlorine (total hypochlorous acid and hypochlorite ion). Unfortunately, these terms are confusing and misleading. Although hypochlorous acid is far more powerful a disinfectant than hypochlorite, the two substances are lumped together as part of the "free available chlorine." Sagewash contains an extremely high percentage of hypochlorous acid due to its lower pH level. Also, Sagewash contains 60 ppm of continuous fresh chlorine, as compared to the batch chlorine concentrations listed above.

Both E. coli and poliovirus III, listed above, are "indicator pathogens," meaning that if a disinfectant kills them, the disinfectant will kill virtually all other bacteria and viruses. Liquid bleach sterilization has been the veterinarian-recommended method to eliminate parvovirus. Sagewash accomplishes this up to 120 times more effectively than liquid bleach without the negative effects of bleach.