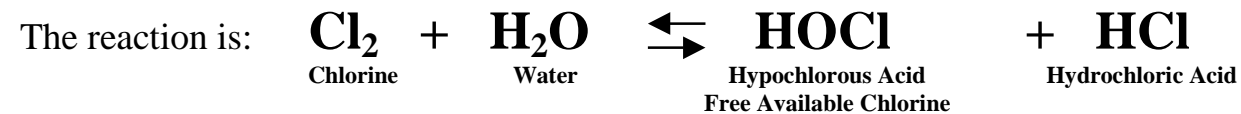


Why Use Fresh+Plus Instead of Bleach

There is a striking difference between the Hypochlor chlorine delivery system used in the PLUS+PLUS SYTEM and bleach. When chlorine gas is added to water it forms hypochlorous acid (HOCl) which is an excellent germ killer. Hypochlorous acid provides free available chlorine (FAC).



Problems develop when chlorine gas is added to water and allowed to sit and age. Just as champagne or carbonated water “go flat” on sitting as the bubbly carbon dioxide gas escapes into the air, chlorine escapes from a hypochlorite solution thus weakening its germ killing value. In order to slow this escape, bleach manufacturers add sodium hydroxide (lye) to their product causing the pH to rise dramatically. Lye burns animal and plant tissues; it saponifies fats in poultry and meat products. **Hypochlorous acid dispensed from FRESH+PLUS contains NO LYE!**

Second, Chlorine in water splits into two forms, hypochlorous acid (HOCl) and hypochlorite (OCl⁻). At the high pH the chlorine provided by bleach is in the hypochlorite form. The chlorine provided by Hypochlor is in the Hypochlorous form (HOCl).

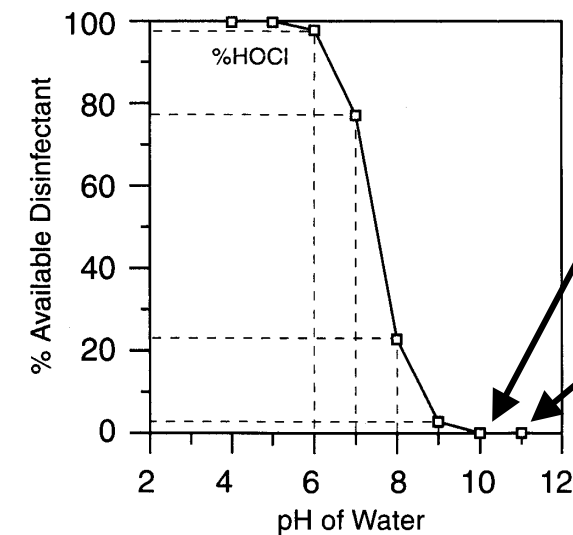


How much of each is present in a chlorine solution is totally dependent upon the pH of the solution. As pH rises, less hypochlorous acid and more hypochlorite is in the solution. As the pH rises, less germ killing power is available. According to a University of Illinois study, **HOCl is 120 times more effective as a sanitizer than the -OCl ion.**

Even at dilutions as low as 1 ounce of bleach to a gallon of water, the pH of the solution is 10.25 and all of chlorine is in the hypochlorite form (-OCl) ion.

Third, If a chlorine solution is does not contain enough HOCl to satisfy the chlorine demand of the surface or product to be disinfected, chloramines will form as chlorine and nitrogen-based materials combine. Examples of nitrogen-based materials are proteins and blood. Chloramines are responsible for the obnoxious odor sometimes associated with chlorine disinfection. **The obnoxious, pungent, eye-stinging smell of chloramines, mistakenly identified as free chlorine, indicates that the chlorine/water mix is not effective. There is not enough HOCl to satisfy the chlorine demand**

Effect of pH on HOCl



IF WE DILUTE:

1 ounce of bleach to 1 gallon with water (1:128),
the pH of the solution is 10.25!

1/2 cup of bleach to 1 gallon with water (1:32);
the pH of the solution is 11.00!

**AT THOSE pH LEVELS, THERE IS NO
HYPOCHLOROUS ACID AVAILABLE FOR
GERM KILLING!**

The same principle applies to processing work surfaces, chillers, flumes, sprays where the water comes in direct contact with meat poultry and seafood. Unless the pH is kept in range (bellow 8) and the ppm of HOCl are adequate, chloramines will form and release chloramine gas.

The delivery system of FRESH +PLUS has a buffering capacity to a pH of 8. Buffering means that the disinfecting solution coming out of the **FRESH+PLUS** or **BUCCANEER** system resists a pH increase when alkalis (bases) are present or added.

The Hypochlor tablets used in the FRESH+ PLUS and BUCCANEER SYSTEMS is exempt from the requirement of tolerance to residues under US Code of Federal Regulations (40 CFR 180.1054)

Fourth, Bleach has a problem with shelf-life stability. Allow a bottle of bleach that starts out at a low-yield 5.25% sodium hypochlorite to sit over time and it weakens as it reverts to sodium chloride (table salt).

THE FRESH+ PLUS system or the BUCCANEER WILL DO THIS FOR YOU

**THE HYPOCHLOR SYSTEM PROVIDES STABLE, SOLID 68% AVAILABLE
CHLORINE TO ASSURE THAT THE GERM KILLING AND OXIDIZING
POWER YOU NEED IS THE STRONGEST AVAILABLE AT THE TIME WHEN
YOU NEED IT!**

ALL AT A COST OF LESS THAN A PENNY PER GALLON

AND, THERE IS NEVER A NEED TO RINSE!!

!

The absolute ease of use is the main benefit of using the Fresh+Plus point-of-use chlorine delivery system. Tablets are furnished in the cartridge shown on the left. The screw top of the FRESH+PLUS dispenser, shown on the right, is removed and the cartridge is inserted into the dispenser.



Simply attach to a water hose. A spring regulates the exposure of individual dry chlorine tablets to the water stream flowing through the dispenser.

There are three units available, one preset to 20 to 30 PPM, and one that can be adjusted to different settings up to 300 PPM and the **BUCCANEER** for large volumes.



After use, the Hypochlor cartridge is simply thrown away and replaced with another. There is no need for you or your personnel ever to come into contact with individual tablets. Because of its point-of-use design, FRESH+PLUS eliminates the need for proportioners, complex metering devices and batch mixing of chemicals by your workers. Since there is no batch mixing and negligible clean-up time, Hypochlor limits worker liability while enhancing worker safety.

REFERENCES

“Evaluation of a chlorine dispensing system, for reduction of pathogenic and spoilage microorganisms on various food products”, Aramouni, Bohra, and Nutsch, Kansas State University.

For FDA approval and treatment levels on post- processing of fish, poultry and beef, see letter dated August 27, 1999, Robert L. Martin, Ph.D.

“Use of KLORMAN for washings fresh seafoods” W. Steven Otwell, Ph.D. University of Florida.

“The difference between Cal Hypo and Bleach as disinfectants” Stanley R. Pickens, Ph. D. PPG Industries, Inc. Chemical Technical Center.

COPIES AVAILABLE ON REQUEST

NOTE TO PUBLIC OFFICIALS: The hypochlorous acid delivery system employed by Fresh+Plus has many other uses in the public health field. In different configurations it can be used to sanitize USDA inspected food processing plants, produce processing and food packaging plants

WHEN DISINFECTING WITH CHLORINE SOLUTIONS, MAKE SURE THAT THE PROPER pH, PPM AND CONTACT TIMES ARE OBSERVED, AND THAT PRODUCTS ARE EPA REGISTERED FOR THE INTENDED USE.

Fresh+Plus™

The KLORMAN Sanitizing System using patented Hypochlor cartridges assures disinfected, sanitized product and processing equipment. This tested, point-of-use system has proven its ability to safely and economically control disease and improve operational efficiency.



Fresh+Plus

Simple and easy to use!

- SIMPLY ATTACH TO A WATER HOSE OR WATER LINE, FOR INLINE OPERATION PRODUCING A CONTINUOUS WATER FLOW OF SUPER CHLORINATED WATER AT THE RIGHT pH AND PPM WITH NO BATCH MIXING REQUIRED. FOR LARGER INSTALLATIONS WE HAVE THE BUCCANEER
- NO RINSING REQUIRED
- APPROVED FOR DIRECT CONTACT AND POST-PROCESSING RINSE OF MEAT, POULTRY, FISH AND PRODUCE WITH NO TOLERANCE LIMIT TO RESIDUE
- **HIGH OXIDATION-REDUCTION POTENTIAL, OVER 800 MV AT 25 PPM FREE AVAILABLE CLORINE**

Fresh+Plus

Works!

- Kills bacteria and viruses on contact including **E.Coli, Listeria, Salmonella and Camphobacter**
- Pathogens cannot develop immunity to chlorine
- Improves shelf-life
- Sanitizes equipment and facilities
- Low maintenance and long shelf-life



Fresh+Plus

- Utilizes components that are:
- USDA Approved
- FDA Approved
- EPA Registration No. 57425-3
- California EPA Registration 57425-3-AA
- Helps to comply with the **FOOD QUALITY PROTECTION ACT.**

For More Information, Contact:

CHLOR AIR

Bob Saldivar

877-483 2871

PO Box 831

Seguin, TX 78156-0831

Robsadl@aol.com

[http:// www.klormansystems.com](http://www.klormansystems.com)

