



AquaSoar[™]

THE KEY TO OPTIMAL ON-FARM
WATER HYGIENE

A Product Overview



Acepsis - AquaSoar™

THE WATER HYGIENE SYSTEM STORY

Improving Animal Wellness Through Optimized Water Hygiene

Water is considered the most essential nutrient for livestock development and production and is needed for numerous processes, such as the regulation of body temperature, growth, digestion, reproduction, metabolism, lubrication of joints, excretion, eyesight, etc. Water is also an excellent solvent for amino acids, minerals, glucose, vitamins, and metabolic waste.



Supporting consistent water quality and palatability across the farm water system



WATER QUANTITY AND QUALITY The total water needs of livestock are met through a combination of the water contained in feed and consumed through drinking water. Livestock require water in **sufficient quantities** and **sufficient quality** for optimal health and growth. To this point, while the basic elements of water, H₂O, remain the same, the rest of what is contained in water is not created equal.



WATER QUALITY | ANIMAL HEALTH Water quality plays a critical role in the health and production of livestock operations. Water quality may be altered by contaminants, such as mineral salts, toxins, heavy metals, organic load, debris, and agricultural practices. Most contaminants will reduce water intake, which results in a reduction in feed intake and a loss of production.



BACTERIA AND BIOFILM Other water quality challenges can include biological activity and organic contamination, which may reduce water palatability and intake and can negatively affect performance. Stagnant water that is contaminated with manure and other contaminants can develop blue-green algae, which may be toxic to livestock. Biofilm is a slimy layer that can develop in water systems and trap organic material and minerals. Many water feeding systems can accumulate this type of buildup over time, especially with warm temperatures and low flow.

To help maintain a clean, fresh water supply and support livestock performance, system buildup (including biofilm) should be managed through routine maintenance, cleaning, and water quality management practices.

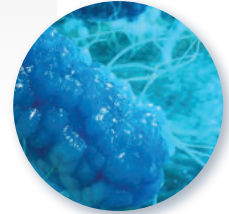
BIOFILM AND WATER HYGIENE



BIOFILM Livestock producers are intimately aware of biofilm within their water systems, at least by its feel.

Biofilm is a slimy, glue-like layer that can coat the walls and surfaces of water systems. It can trap organic material and contribute to maintenance and water quality challenges, especially when temperatures are warm and water flow is low. Routine cleaning and maintenance practices can help manage this buildup.

Removal of biofilm becomes a primary hygiene activity within livestock operations. While formed by bacteria, biofilms also provide protection to a host of other disease-causing organisms.



Dr. Donald Sockett, DVM, from the Wisconsin Veterinary Diagnostic Laboratory (WVDL) cites, "Chlorine dioxide (ClO_2) is the most effective disinfectant for *Cryptosporidium*, providing the quickest action at the lowest concentration among available disinfectants. The product has good biocidal activity against *Mycoplasma*, Gram-positive and Gram-negative bacteria, algae, yeast, enveloped viruses, chlamydia, non-enveloped viruses, fungal spores, parvovirus, acid-fast bacteria, bacterial spores and protozoan cysts. Among scour pathogens, ClO_2 provides a quick kill and concentration and time values on coccidian, crypto and giardia oocysts."

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THE OPTIMAL WATER HYGIENE TECHNOLOGY

CHLORINE DIOXIDE is an oxidizing agent used in many controlled water quality management programs. When applied appropriately, it can help manage system buildup and support consistent water system operation. Sodium hypochlorite (bleach), and hydrogen peroxide, on the other hand, have been proven to have less effect on system buildup and do not support water quality.

Measurement of Oxidizing Agent ORP Values In Pathogen Disinfection**

OXIDIZING AGENT | OXIDIZING AGENT ORP VALUE RANGE (mV)

CHLORINE DIOXIDE (ClO ₂)		600 → 1000 MV
OZONE* (O ₃)		700 → 1000 MV
IODOPHORS (I ₂)		400 → 600 MV
HYDROGEN PEROXIDE		300 → 500 MV
SODIUM HYPOCHLORITE		250 → 500 MV



ORP Values In Pathogen Disinfection**

PATHOGEN SURVIVAL IN SECONDS (S) OR HOURS (H) AT ORP LEVELS (MV)

Pathogens	<500 ORP (mV)	500 - 600	600 - 700	700+
E. COLI (0157:H7)	> 300 S	< 60 S	< 10 S	< 1 S
SALMONELLA SPP.	> 300 S	> 300 S	< 20 S	< 1 S
LISTERIA MONOCYTOGENES	> 300 S	> 300 S	< 30 S	< 1 S
THERMO-TOLERANT COLIFORM	> 48 H	> 48 H	< 30 S	< 1 S

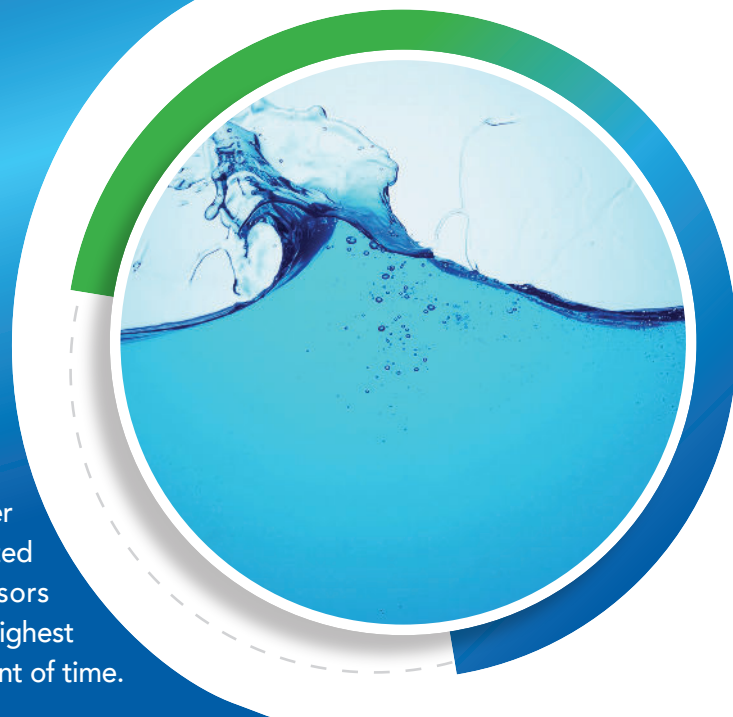
*Ozone is greatly influenced by the water quality and ozonation system.

**Oxidation Reduction Potential (ORP) for Disinfection Monitoring, Control and Documentation; University of California, Trevor Suslow, Department of Vegetable Crops, University of California - Davis

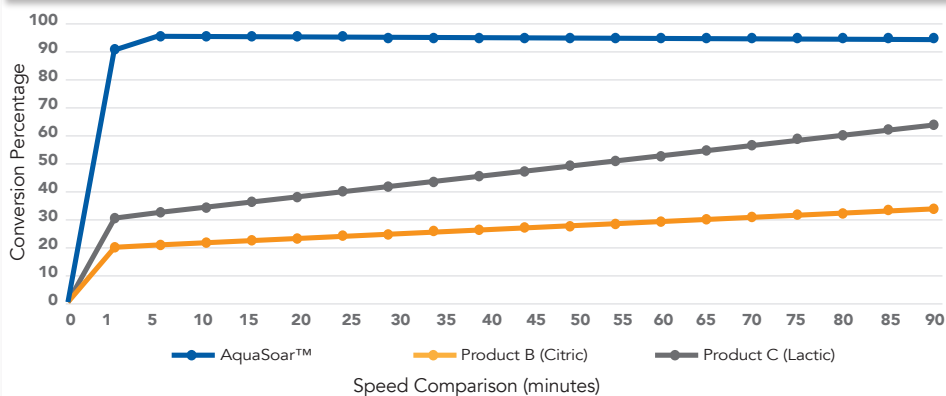
AquaSoar™

THE ULTIMATE WATER HYGIENE TECHNOLOGY

AquaSoar™ is a concentrated, two component, activator / base technology that produces chlorine dioxide on site, using the farm water source for dilution. The specially formulated AquaSoar™ Activator / Base precursors produce chlorine dioxide at the highest yield, in the shortest amount of time.

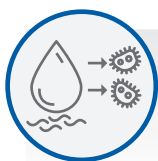


AquaSoar™ Speed Comparison (minutes) | Conversion %



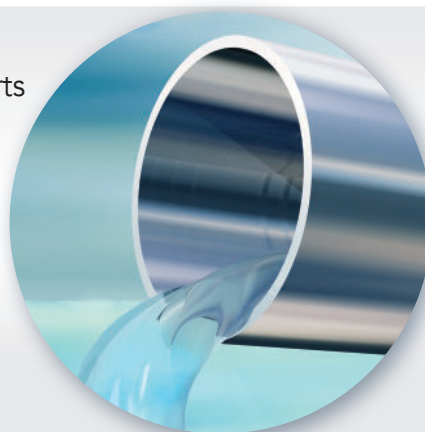
This graph shows that AquaSoar™ produces the highest level of chlorine dioxide in comparison with other activation formulations. Concentrated precursors, producing more, faster, at the highest yield saves a great deal of cost within the system.

The AquaSoar™ Activator and Base precursors are specifically formulated for purity and efficiency of reaction. AquaSoar™ produces the highest level of chlorine dioxide within the shortest period of time, making it a perfect fit for on-farm production and dosing.



SURFACE BUILDUP MANAGEMENT AquaSoar™ supports

water system maintenance by helping manage organic deposits that contribute to biofilm-related buildup. Used as part of a water quality program, it supports cleaner lines and more consistent system operation and thereby providing clean, palatable water to your herd.



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NEXT STEPS TO AN OPTIMAL HYGIENE & MAINTENANCE PROGRAM

1 COLLECT WATER SAMPLES at the water source and throughout the livestock housing facilities, identifying a full water analysis of the operation

2 OUTLINE A SUGGESTED WATER HYGIENE program specific to a facility

3 INSTALLATION hygiene system components:

- Mixing system
- Dosing system
- Monitoring system
- Monitoring and calibration of the system
- Service and support



The concentrated AquaSoar™ Activator + Base are diluted on farm to create AquaSoar™ CONCENTRATE, providing maximum Hygiene output. The concentrated precursors ensure the lowest cost per use and greatest water hygiene value.



For more information, call Acepsis® or your local representative.

ACEPSIS®, LLC is an animal health based company that is focused on the development of state-of-the-art animal hygiene technologies. Our Company's mission is to apply innovative animal hygiene technologies into the agricultural and veterinary market sectors.