

AquaSoar™

A COMPLETE WATER HYGIENE TECHNOLOGY FOR SWINE FARM WATER SYSTEMS



AquaSoar™ is an ultra-concentrated, two component, activator and base technology that, when mixed produces chlorine dioxide on-site, using the farm facility's water source for dilution.

TYPICAL CHLORINE DIOXIDE WATER TREATMENT APPLICATIONS

- Potable water hygiene
- Potable water taste and odor control
- Potable water component oxidation and control (iron and manganese)
- Biofilm removal and control



WATER FOR ALL SWINE Water is referred to as the most essential nutrient for swine health and production. Water aids in animal digestion, growth, production, and reproduction, regardless of the animal species . . . but not all water is equal!

WATER QUALITY | ANIMAL HEALTH Water quality plays a crucial role in the health and production of swine operations. Water quality can be adversely affected by the formation of biofilms in swine waterers and the water distribution systems, establishing a persistent reservoir for pathogenic bacteria, protozoan cysts (cryptosporidium and Giardia), algae, molds and spores.

Chlorine dioxide is considered a strong and very selective oxidizing agent. Chlorine dioxide is used as a water hygiene agent to control biofilm, bacteria (*E. coli*, *Salmonella*, *Listeria*, *Staphylococcus aureus*, *Streptococcus uberis*, *M. bovis*, viruses, algae, fungi, protozoans (*Cryptosporidium*, *Giardia Lamblia*) and *Legionella*. Unlike sodium hypochlorite (bleach) chlorine dioxide does not chlorinate organic substances that form trihalomethanes (THMs) or trihaloacetic acids, nor does it react with ammonia to form chloramines.

Dr. Donald Sockett, DVM, MS, PhD, ACVIM at the Wisconsin Veterinary Diagnostic Laboratory states: "Chlorine dioxide is the most effective disinfectant, for *Cryptosporidium*, providing the quickest action at the lowest concentration among available disinfectants. Chlorine dioxide has 2.5 times the oxidizing capacity of bleach, with full biocidal activity at pH levels from 2 – 12 and does not produce eco-toxic byproducts, such as THMs or chloro-phenols."

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	< 1S
SALMONELLA SPP.	> 300 S	> 300 S	< 20 S	< 1S
LISTERIA MONOCYTOGENES	> 300 S	> 300 S	< 30 S	< 1S
THERMO-TOLERANT COLIFORM	> 48 H	> 48 H	< 30 S	< 1S

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





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RESEARCH RESULTS

Research was done in Canada on a pig farm with 4 houses and 16,000 pigs to compare conventional water treatment with chlorine dioxide for pig growing. The following Tables show the results:

CONVENTIONAL WATER SANITIZER (IODINE)							
ROOM	STARTING DATE	# of Pigs	STARTING WEIGHT (Kg)	ENDING WEIGHT (Kg)	MORTALITY (%)	GAIN per DAY (g)	FEED CONVERSION RATIO
1	12/9/2008	1906	6.95	27.31	2.31	424	1.54
2	12/1/2008	2275	6.85	28.27	3.23	437	1.50
3	12/1/2008	2087	6.73	29.21	3.02	478	1.31
4	12/23/2008	2161	6.71	28.4	2.75	452	1.43
Total:		8429					
		Average:	6.81	28.3	2.83	448	1.45

CHLORINE DIOXIDE							
ROOM	STARTING DATE	# of Pigs	STARTING WEIGHT (Kg)	ENDING WEIGHT (Kg)	MORTALITY (%)	GAIN per DAY (g)	FEED CONVERSION RATIO
1	11/14/2008	1729	6.80	27.94	2.32	472	1.44
2	11/17/2008	2084	6.99	27.94	3.16	419	1.41
3	11/28/2008	2047	6.99	30.37	2.15	477	1.30
4	11/28/2008	1664	6.74	30.26	2.69	470	1.52
Total:		7524					
		Average:	6.88	29.39	2.58	460	1.43

CHLORINE DIOXIDE ADVANTAGES:	ENDING WEIGHT	MORTALITY	GAIN per DAY	FEED CONVERSION RATIO
	+ 2.82%	- 8.8%	+ 2.68%	+ 2 points

After the research period, the total profit increase for the grower was CN \$16,436 (U.S. \$13,539).



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MIXING INSTRUCTIONS

AquaSoar™ Activator / AquaSoar™ Base 1000 are the components of a two-part concentrated precursor formulation needed to create AquaSoar Concentrate. Use only as directed. Always dilute the specified amount of AquaSoar Base 1000 in water prior to mixing with the specified amount of AquaSoar™ Activator. Reference the table below when mixing the AquaSoar Activator / Base 1000 precursors with water. The AquaSoar™ Dilute Activator can then be mixed with the AquaSoar™ Dilute Base on a 1 part Activator : 1 part Base mixture, making AquaSoar™ Concentrate at a 5000 PPM level. Always use soft water when producing AquaSoar™ Concentrate.

AQUASOAR™ PRECURSOR MIXING GUIDE

PRECURSOR	PRECURSOR AMOUNT	WATER AMOUNT	TOTAL AQUASOAR™ DILUTE PRODUCED	AQUASOAR™ CONCENTRATE (A + B) TOTAL AMOUNT	ClO ₂ PPM PRODUCED (TOTAL TITRATABLE)
AQUASOAR™ ACTIVATOR (A)	1.0 OZ.	54 OZ.	55 OZ.	110 OZ.	5000
	1.0 GAL.	54 GAL.	55 GAL.	110 GAL.	
	5.0 GAL.	270 GAL.	275 GAL.	550 GAL.	
AQUASOAR™ BASE 1000 (B)	1.0 OZ.	54 OZ.	55 OZ.	110 OZ.	5000
	1.0 GAL.	54 GAL.	55 GAL.	110 GAL.	
	5.0 GAL.	270 GAL.	275 GAL.	550 GAL.	

DOSING INSTRUCTIONS

Dosing instructions and systems vary dependent upon the amount of water being treated. See the Acepsis™ Dosing System Worksheet for an explanation of features and recommendations based upon individual system needs. Typically, AquaSoar™ Concentrate is dosed at levels from 0.3 a 0.8 PPM per gallon on a system maintenance basis. Using a mid-point of 0.5 PPM, a gallon of 5000 PPM of AquaSoar™ Concentrate can treat 10,000 gallons of on-site water. It is important to understand that all water sources differ in their component make-up of the water. As per the Acepsis™ Dosing System Worksheet, it is recommended that a full water analysis be completed to make an accurate assessment of the individual system requirements.



PART #	DESCRIPTION
ACEC04	AquaSoar™ ACTIVATOR – 4 X 1 GAL
ACEC05	AquaSoar™ ACTIVATOR – 5 GAL
ACEC15	AquaSoar™ ACTIVATOR – 15 GAL
ACEC55	AquaSoar™ ACTIVATOR – 55 GAL
ACE2C04	AquaSoar™ BASE 1000 – 4 X 1 GAL
ACE2C05	AquaSoar™ BASE 1000 – 5 GAL
ACE2C15	AquaSoar™ BASE 1000 – 15 GAL
ACE2C55	AquaSoar™ BASE 1000 – 55 GAL

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. Visit us at www.acepsis.com.



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