credence

don’t let drinking water quality give you a headache

Credence - clear water with pHizz...

kiotechagil

Performance in aquaculture&agriculture

credence

Water soluble effervescing tablets offer simple, precise dosing. Free available chlorine is rapidly released - without the need for crushing or agitation of the solution, which is ready for use within 30 minutes. Credence tablets acidify the water. This potentiates the activity of chlorine which has a wide spectrum of activity against bacteria, virus and fungi. Credence has a unique 'reservoir' effect which prolongs its activity.

high potency

Free available chlorine is a measure of the total dissociated and undissociated chlorine, but it is the undissociated hypochlorous acid component (HOCl) that has the biocidal potency. The lower the pH the greater the percentage of HOCl in solution.

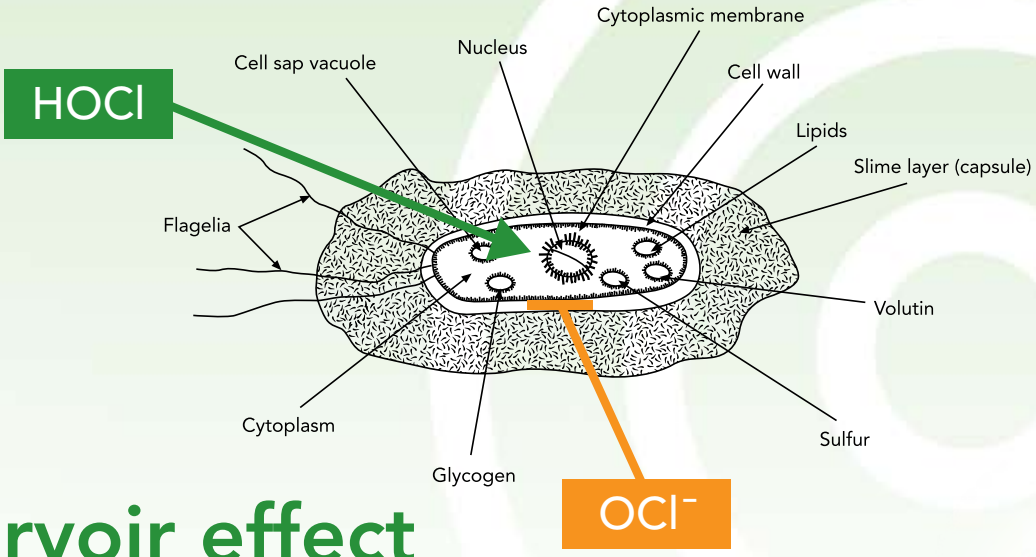
Credence tablets give an acid pH of water in the range 5.5-6.5 which release over 90% of undissociated HOCl compared to typical hypochlorite which usually has less than 10%.

Undissociated HOCl vs. pH

pH	HOCl % at 20°C
5.0	99.740
5.5	99.180
6.0	97.450
6.5	92.370
7.0	79.290
7.5	54.770
8.0	27.690
8.5	10.800
9.0	3.690
9.5	1.190
10.0	0.380
10.5	0.120
11.0	0.040
11.5	0.012

Hypochlorous acid is electrically neutral. This allows it to diffuse through the cell wall where its lethal action is the result of the oxidation of cell proteins or enzyme systems by chlorination causing hydrolysis of the peptide chains of the cellular membrane. This gives a high activity against bacteria, Mycobacteria, virus, bacterial and fungal spores and fungi.

Schematic diagram of a bacterium illustrates the bacterial membrane permeability to undissociated HOCl (the result of low pH) compared to total dissociated chlorine (OCl^-) resulting from high pH.



reservoir effect

The amount of HOCl present is governed by the pH but with NaDCC an additional feature is that only 50% of the 'total' available chlorine is actually present as 'free' available chlorine. The remaining 50% is combined in two forms – mono or dichloroisocyanurate. The ratio of free and combined available chlorine always remains at 50:50.

All chlorine forms are utilised when active against micro-organisms or as a result of organic soiling when the 'free' available chlorine is then used up. The reservoir chlorine in the 'combined' available chlorine will be progressively released to restore the 50:50 equilibrium. This continues until all the available chlorine is used – and this controlled release is why NaDCC is inactivated more slowly than other chlorine sources.

trial results

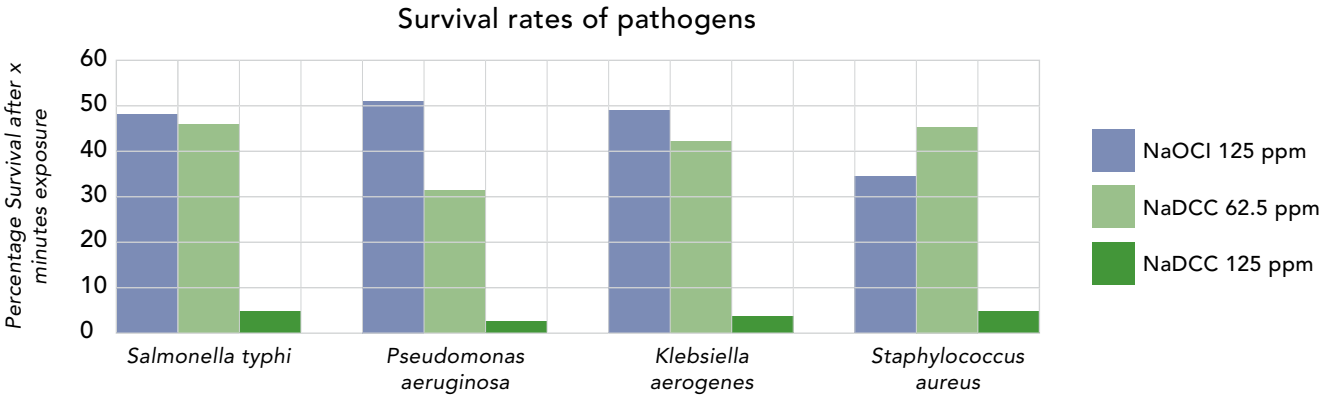
1 Disinfectant Comparison

Study on the effect of pH on release of undissociated hypochlorous acid versus different chlorine donors. Results reported after 30 minutes in tap water.

Effects of Various Disinfectants on pH and HOCl Dissociation										
Dosage (Free Available Chlorine)	Initial		After 30mins (standardised) pH; % undissociated HOCl							
			CREDENCE		Halazone		2% Sodium Hypochlorite		64% Calcium Hypochlorite	
	pH	HOCl	pH	HOCl	pH	HOCl	pH	HOCl	pH	HOCl
2 ppm	7.0	79.3%	6.91	82.5%	7.33	64.1%	7.09	75.7%	7.24	68.7%
5 ppm	7.0	79.3%	6.89	83.1%	7.72	42.2%	7.22	69.7%	7.33	64.1%
10 ppm	7.0	79.3%	6.84	84.6%	8.21	19.1%	7.42	59.3%	7.44	58.1%

2 Disinfecting capacity of NaDCC and Sodium Hypochlorite

Tests were carried out on four major bacterial species comparing standard solutions of NaDDC and Sodium Hypochlorite at 125ppm. The superior activity of NaDCC over NaOCl was demonstrated even at 50% strength.



3 Results in Broilers and Layers

Broiler Farm Study - Water Quality

	Coop 1		Coop 2	
	Before Treatment	35 minutes after treatment	Before treatment	35 minutes after treatment
Aerobic mesophilic bacteria (CFU/Litre)	77,000	0	68,000	0
Total coliforms (CFU/litre)	88	0	210	0
Foul smell from litter	YES	NO	YES	NO
Identification of	*Aeromonas hydrophila*	---	*Citrobacter freundii*	---
Activity	Not Disinfected	Disinfected	Not Disinfected	Disinfected

trial results cont.

4 Egg Laying Performance

Monthly Averages

	Treated Group		Control Group	
	% laying	% breakages	% laying	% breakages
December	73.0	2.9	66.6	3.4
January	60.0	2.8	64.7	3.6
February	65.1	3.1	64.2	3.6
March	62.1	3.6	*58.3*	3.6

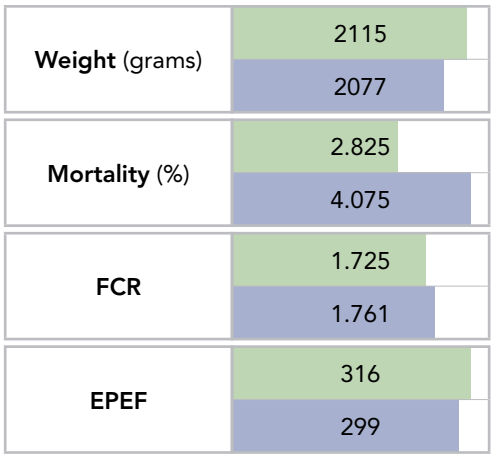
Overall there was better laying performance, with fewer breakages in the treated group. A lower pH in the water is known to improve calcium bioavailability.

5 Broiler Chicken Study Weight Increase & Mortality

	Treated Group (23350 birds)		Control Group (13900 birds)	
Week	Weight (g)	Cumulative Mortality	Weight (g)	Cumulative Mortality
1	144	86	140	83
2	360	170	350	143
3	600	213	500	193
4	1050	272	800	360
5	1250	558	1100	946
6	1650	601	1600	968
7	1821	654	1673	1015

The average increase in weight was almost 9% for the treated group when compared to the control group. Mortality was reported as 2.8% for the treated group and 7.3% for the control group.

6 Performance Benefits in Broilers



Two trials comparing the effect of Credence treated water with non-treated water gave significant cost benefit advantages to the broilers using Credence. These results are based on the average of the two trials for the birds as-hatched.

CREDENCE

CONTROL

When dissolved in water, one CREDENCE 1000 tablet releases 5g of free available chlorine – sufficient for 1000 litres of drinking water.

At different concentrations CREDENCE 1000 tablets can be used for other disinfectant applications.

	Solution Strength (ppm Available Chlorine) One Tablet Per Volume of Water					
Litres	5	10	15	100	200	1000
ppm	1000	500	333	50	25	5
Application	Foot Baths, Wheel Dips	Vehicles, Equipment, Porous Surfaces	Non-porous Surfaces	Hand Washing	Water Systems	Drinking Water

CREDENCE 1000 tablets dissolve in 8 minutes without stirring and solutions are ready to use in 30 minutes. CREDENCE 1000 tablets are white with a breakline. Tablets can be divided along the breakline when half volumes of water are used.

Shelf life: 3 years in the screw top tub.

Distributor:

For further information

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