

GO₂TM for POULTRY PRODUCERS

The importance of drinking water quality for the production and performance of birds has become one of the most important management tools. Without an adequate supply of good quality water, bird performance will be impacted. The key is not just the adequate supply of water, but good quality water.

Water can be a source of contamination if the microbiological load in the water is too high. This also adversely impacts digestion and absorption of nutrients from the feed, as well as additives like medications, vaccines and vitamins.

Routine drinking water additives, like vaccines and vitamins, contribute to a polysaccharide layer inside the drinking lines, commonly called "slime". Harmful micro-organisms attach to the inside of the line and develop and flourish within this layer. The waterborne bacteria are difficult to kill due to their protective cell wall and encased protection within the slime. Most water treatments and disinfectants, including chlorine, cannot penetrate or degrade the cell wall, nor penetrate and eliminate the slime.

Routine washing of drinkers and flushing water lines between flocks is not sufficient because these practices do not remove the source of the problem inside the drinking system. Even with "good quality water", problems effecting health and performance occur because the contaminants are inside the lines.

The ultimate water treatment product should:

- Remove the slime
- Destroy the micro-organisms within the lines
- Prevent any new build-up of slime
- Reduce the microbial population to a very low level
- Leave no residues to accumulate in the meat

Improved water quality management leads to healthier, better-performing birds with lower overall costs and higher profits for growers. GO₂ delivers all these improvements. Result: cleaner water, less bacterial contamination, better water taste and healthier birds.



GO₂ comes in dry-powder form. 0.5kg (1.1 lbs) of component A and 0.5kg of component B produces 25 liters (6.6 gal) of 4,000 ppm ClO₂. Large sizes are available. Only a dosing pump with a flow sensor (optional) and a mixing tank are required. GO₂ is a clean process. It is environmentally friendly, and produces zero by-products.

GO₂ is a pure chlorine dioxide product (ClO₂) manufactured as two powder components which are mixed into tap water on-site. This produces a 95.0+% pure liquid ClO₂ solution within 30 minutes, at a concentration of 4,000 ppm. This concentrate is then simply dosed into the target water to produce safe treated water. Minimal investment in equipment or infrastructure is required to use GO₂. The product is simple to use, easy to transport and store. It has a shelf life of 5 years. One gallon of GO₂ will treat 20,000 gallons of water at 0.2 ppm. When mixed, the concentrate has an active life of up to 60 days.

GO₂ is the 21st Century replacement for environmentally harmful chlorine. In treating human and animal drinking water, pure ClO₂ is ten times more powerful than chlorine and chlorine-type disinfectants. GO₂ removes odors, iron, manganese, phenols and cyanides from water and creates zero harmful disinfection byproducts, such as free-chlorine, chloramines, chlorites and chlorides, which all affect poultry health. GO₂ is not corrosive to pipes, pumps and equipment and leaves no residue except trace amounts of common salt.

GO₂ APPLICATION BRIEF

GO₂ Key Features

- Easy and effective to apply
- Environmentally "GREEN" chemistry
- Treat and reduce slime and prevent its reformation in drinking and process water systems
- Improved production results and FCR
- Widely used as a water disinfectant for industrial, agricultural, municipal and consumer applications
- Competitive costs compared to conventional chemicals treatments

GO₂ Result: Extra profit for growers.

Birds perform better! They have a better feed conversion rate, and grow bigger and healthier. This is the natural result of drinking clean, healthy water. Birds develop less diseases and intestinal infections. This translates to higher settlement checks. Fewer medicines are required to raise flocks, lowering growing costs.

Use of GO₂ in the US evidences the efficacy of the product. Growers improved in settlement ranking and flocks showed reduced mortality, lower condemnation, **better FCR** and heavier and healthier birds.

Tests in Georgia (USA) proved profitable for the grower:

Profit increase over 4 flocks	\$14,482.36
GO ₂ Cost of Product for 4 flocks	\$2,700.00
Equipment (deprec. over 3 years)	\$700.00
Net additional profit by using GO₂	+ \$11,082.36

TOTAL	Livability	Av. Wgt	FCR	Profit
	%	Kg	points	per 1000 (\$)
BEFORE	95.992	2.471	1.997	\$ 279.30
AFTER	96.910	2.553	1.953	\$ 297.90
PERFORMANCE IMPROVEMENT				
<i>in units</i>	0.918	0.083	-0.04	18.60
<i>in percent</i>	+0.96%	+3.3%	+2.2%	+6.7%

US Only

In Canada, similar results have been demonstrated. Birds were the cleanest ever received by the processing facility. Condemnations dropped from 1.8% to 1.4%. Average broiler weight increased from 4.91 lbs to 5.32 lbs. The grower received a significantly higher pay check for his birds: the margin per kilo increased 7.0%.

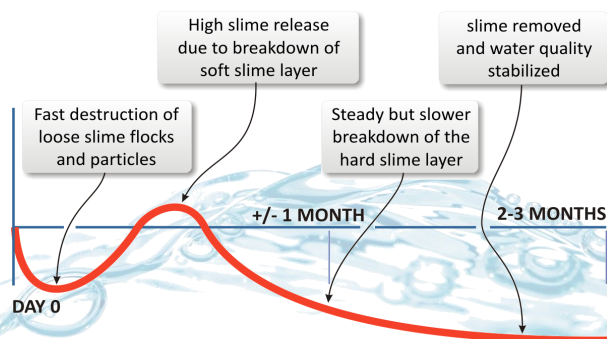
These are the results of tests in Georgia, USA. Tests involved 9 houses with a total of 161,000 birds, grown to 51 days. Tests with GO₂ included 4 flocks over a period of 10 months.

How ClO₂ removes slime

Slime in drinking water is a constant threat to livestock health. In Europe, thousands of growers use ClO₂ in livestock drinking water and houses. ATP readings have shown that the chart below is typical when using GO₂. There is no need for any other product to prevent slime. Slime is eliminated from the entire drinking system. This lowers the health challenge to birds and improves their performance.

GO₂ Applications in the Poultry Industry

- Well water and drinking water treatment
- Potable water treatment with excellent slime control
- Carcass washing and grinder disinfection
- Food processing aid in secondary food processing and RTE meats
- Egg washing
- Facilities treatment: walls, floors, ceiling, equipment, cages, fogging, etc.
- Shelf-life extension
- Truck cleaning for livestock transportation between farms
- Bio-security Programs with consistent and on-going performance



GO₂ APPLICATION BRIEF

How to use GO₂

GO₂ can be used as a shock treatment at 25ppm to rapidly remove slime from the drinking system during period the house is de-populated. Simply fill the entire system with a 25ppm solution, leave this shock dose in the system for 12-to-24 hours, trigger the nipples and then completely flush the system prior to bird placement.

GO₂ can be used at 1ppm at bird placement to gradually remove slime during the production cycle.

- Start at 1ppm in the distribution system.
- Continue at 1 ppm for 2-to-3 weeks
- Reduce to 0.5ppm for 2 weeks
- Reduce to 0.2ppm for life of flock and continuously thereafter

GO₂ Cleaning Properties

- Higher yield. Up to 260% more oxidation power than chlorine
- GO₂ does not chlorinate organic materials
- Steady bactericidal efficacy within pH levels pH 4 to 11
- ClO₂ is 99.9% effective against most water-borne micro-organisms (Bacteria, Viruses, Protozoa, Fungi, Mold, Spores, Algae)
- ClO₂ does not allow build-up of resistance in micro-organisms
- Kills airborne pathogens when misted

GO₂ Chemical Properties

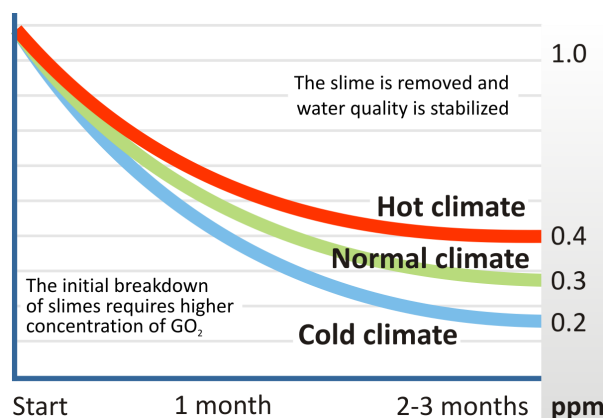
- Unlike chlorine, GO₂ does not react with ammonia, ammonium or most organic compounds
- Decreases THM's, HAA's, MX and other harmful compounds
- No free chlorine, chlorite, chlorate or chloride
- High efficiency in the removal of iron and magnesium

GO₂ 4,000 ppm concentrate can treat the following amounts of water at 5 pre-set concentrations:

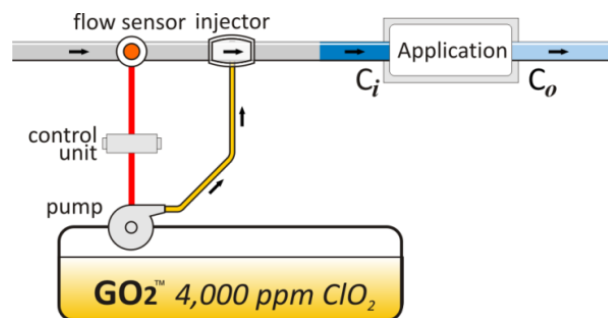
4,000ppm KIT FOR	1.0 ppm	0.5 ppm	0.3 ppm	0.2 ppm	0.1 ppm
13.2 Gallons	52,834	105,669	176,115	264,172	528,344
50 Liters	200,000	400,000	666,667	1,000,000	2,000,000

GO₂ Benefits

- 5-year guaranteed shelf life (in unused and unopened jars/pails)
- Easy to apply (standard low cost industrial dosage equipment)
- High solubility in water; can be applied in a very short time



After slime is removed, operational concentration can be lowered to 0.2 - 0.4 ppm, depending on climate conditions.



To apply GO₂, the only equipment required is a storage tank, a flow sensor and dosing pump. These costs are minimal and eliminate the high investment hurdle required by conventional equipment-based ClO₂ generation technology.

GO₂ APPLICATION BRIEF

- Up to 60 day shelf-life in activated solution
- Produces 95%+ pure ClO₂

GO₂ Operational Properties

- No residues
- Non-corrosive at use dilution
- Single-product water cleaner and conditioner
- Easy and simple to use

As of 2008, ClO₂ has been adopted in many countries as a water disinfectant. Customers from a variety of industries where water is essential include drinking water, waste water, food and beverage producers, bottled water companies, agriculture, horticulture, aquaculture, livestock, poultry, vegetable, fruit and produce washing, meat processing, the food industry, retail grocery chains, restaurants, the pulp and paper industry, the oil and gas industry, hotels, hospitals, cruise ships and marine vessels, military, swimming pools, hot tubs and spas, ornamental water, ponds and aquaria.

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