Chlorine Dioxide (ClO2) - No more 'fowl' play

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Ensuring the bacterial safety of poultry is essential and water is the most critical resource in the poult broiler process. Chlorine Dioxide (ClO2) is a powerful disinfectant and is fast becoming one of the mo effective solutions for optimal water treatment.

Brandon Mitchell

The water we drink is essential to our health and even small amounts of contaminants found in our water, can increase ou susceptibility to many of the chronic illnesses we are experiencing today.

Studies show that pathogens such as campylobacter and salmonella, that contaminate food and water at the poultry broile stage, is the main contributing factor for the manifestation of such organisms in packaged product at the processing plant For poultry broilers, providing water of a suitable microbiological quality is both a necessity and a challenge as broilers consume approximately 1.6 to 2.0 times as much water on a weight basis as feed. It is an essential nutrient in bird metabolism and nutrition.

Additionally, high microbial loading in poultry drinking water places an additional strain on the bird, in that the microorganisms can compete for available nutrients, and the energy expended on combating the ingested microorganisms energy not expended in weight.

According to a study by North Carolina Cooperative Extension, College of Agriculture and Life Sciences, standards for animal drinking water indicate that there should be fewer than 100 bacteria of all types per milliliter (ml) of water and fewe than 50 coliform bacteria per ml. Recent field research indicates that a bacteria level of zero may be desirable to obtain optimum performance. http://www.ces.ncsu.edu/depts/poulsci/tech_manuals/drinking_water_quality.html

Many factors affect the health and performance of poultry broilers, but few, if any, are more important than water. A clear safe water supply is a necessity if each brood is to perform at its best. Often, however, the water supply is the last thing y think about if you are having problems with growth rate, feed conversion and bird health.

“Suffice it to say that having access to disinfected water is a must for poultry farmers. Companies are beginning to look fo alternatives to chlorine for a variety of reasons and are now looking to Chlorine Dioxide as the preferable disinfectant”, sa Brandon Mitchell, Director of Enaqua, a Water Solutions specialist company in South Africa.

Chlorine dioxide has been used in municipal water disinfection for more than 50 years in Europe and North America, solv taste and odour concerns and reducing disinfection by-products. In Southern Africa Chlorine Dioxide's use is continually growing across industries such as bulk water, food and beverage and other industrial disinfection and oxidation applicatio

Previously, the capital costs associated with the required onsite generation equipment has proved a limiting factor, howeve now new technology and improvements in the current technology, makes it practical to use the chemistry in a wider range water treatment applications.

Brandon Mitchell adds, "Poultry water treatment cannot exist in a vacuum and there is never a one size fits all solution. The needs to be a thorough design, development and implementation process facilitated. This, after the acquisition of wide background data and expert knowledge has been applied, both in theory and in practise. Water solutions by design, entail performance monitoring and on-site specialist support to protect your investment. The functionality of the design as well as the ongoing process management is tantamount to the success of each individual system".

Poultry drinking water treatment programs require qualified technical teams that work alongside your nutritional and veterinary specialists to achieve exceptional brood performance, and a truly integrated approach to poultry biosecurity.

The key motivators of Chlorine Dioxide within poultry drinking water treatment include:

Cost effectiveness

The value derived from improved efficacy not only ensures a cleaner water distribution, but water storage will require less effort and disinfection between cycles. This directly impacts the improvement of brood performance, which has positive financial implications and at the same time preserves the life of the equipment, water distribution piping and drinkers etc.

Poultry broiler performance

Through effective disinfection of poultry broiler drinking water via the maintenance of a low Chlorine Dioxide residual withi the distribution, water is effectively removed as a vector for infection. A clean disinfected water supply results in lower mortalities and improved food conversion ratios.

Mitchell says "Trial work done locally (in South Africa) has recorded improvements in performance of poultry broods wher disinfected with Chlorine Dioxide including; 0.05Kg improvement in live weight, 2.71% point reduction in mortality and 0.0 improvement in food conversion ratio".

Biofilm Destruction

A key property of Chlorine Dioxide is that it is effective at penetrating and removing biofilm, unlike chlorine, which biofilm l proven to be resistant to. Biofilm formation within water distribution systems, is a significant problem, in that, it continually acts as a source of inoculum of bacteria into the water distribution.

It increases corrosion and can harbour micro-organisms, such as legionella, that poses a significant risk to human health. One of the main selection criteria should be its ability to prevent the formation of biofilm within the distribution system. Chlorine Dioxide has been shown to effectively penetrate biofilms removing them at their attachment level.

Practicality

In comparison to chlorine, Chlorine Dioxide is effective across a wide pH range and has significantly fewer side reactions less corrosive, can be used in a lower concentration and forms fewer disinfection by-products.

Environmental safety

In general Chlorine Dioxide has a lower environmental toxicity when compared to other residual bearing disinfectants. The predominant disinfection by-products of chlorine dioxide are chlorite and potentially chlorate. Both are subject to degradat

to harmless chloride.

Well designed, precise water solutions are fast becoming the difference between an organisation that is responsible and c the forefront of innovation, and those that are straggling behind, using invasive and ineffective chemicals that jeopardise th product quality, the environment and the costly equipment used in the poultry broilers, whether it be at the drinking water phase or the process water used.
Selection of the correct disinfection system, installation, maintenance and then traceability are key components to the completion of a successful water management plan, which essentially aims to close the biosecurity hole in the poultry industry.

About Enaqua:

Enaqua is a proudly South African company which boasts more than 20 years of experience, their expertise including specialist design, building and implementing water treatment plants and solutions. Enaqua offers creative value-added solutions from maintenance of existing plants to brand new purpose-built systems.

Their service offerings include: UV Disinfection Systems, Chemical Disinfection Systems, Reverse Osmosis Disinfection, System Design and process Engineering.
Their highly experienced team believe in designing sustainable solutions that meets a client's process, capital, operating a environmental needs and requirements.

Every system they design is purpose built. If you have a complex and specialised water treatment challenge, Enaqua will b able to solve it.

Water Solutions by design

For further information on Enaqua please visit http://enaqua.co.za

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