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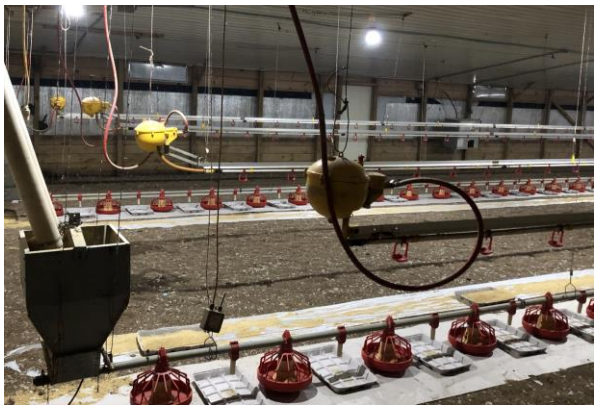
Chlorine Dioxide Treatment of Poultry Drinking Water

Selective Micro Technologies has completed initial rounds of testing at a broiler chicken farm in North Carolina. The purpose of this testing was to determine the effects of chlorine dioxide treatment of the drinking water for these birds. Results of this trial can be found below.

Study Design:

SMT technicians visited a broiler chicken farm in North Carolina. This particular farm had four individual barns that had the capacity to house approximately 74,000 total birds combined. Each house's water supply was previously being treated by an acidified sodium chlorite product, which was removed for the duration of the treatment. Before placement of chicks, SMT technicians generated concentrated chlorine dioxide in order to carry out a shock treatment, which includes filling the lines with higher than normal concentrations of ClO2, and allowing an extended contact time. This is performed in order to remove any buildup of bio-slime or algae that might exist in the water distribution system. These organic growths can harbor pathogenic organisms that cause sickness in the birds.

To carry out treatment, SMT utilized Dosatron injection pumps. ClO2 concentrations of nearly 25 ppm were injected into the water lines. The water was allowed to flow through the end of the distribution system until detected at 10 ppm. At that point, the water line was closed, and the ClO2 was allowed to dwell for 1 hour. After one hour, Dosatron pumps were bypassed, and water lines were flushed of any residual chlorine dioxide and organic material. High volumes of buildup could be seen clearing from the lines, indicating a previously high organic contamination.



Above: Poultry water lines from a North Carolina broiler chicken barn.

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Above: Contamination that has been removed from the water distribution system.

Some of what was removed from the lines can be seen on the inside of the distribution in the photo to the left.

After the shock treatment was completed, and the residual ClO2 flushed, the Dosatron injection ratio was lowered in order to pump a continuous concentration of 1 ppm into the water lines. This concentration was maintained for the duration of the birds' lives.

Results:

Two flocks of birds received drinking water treated with chlorine dioxide. Each flock was raised for approximately seven weeks. At the end of each cycle, the birds were collected, and the average weight was calculated for the entire population. Both qualitative and quantitative data were collected.

Qualitative

During the treatment phase for each flock, the farmer reported that birds appeared cleaner and healthier than before. This was attributed to firmer excrement during growth. The farmer reported that in the past, his birds would sometimes pass watery stool, which then contaminated the feathers of the birds giving them a very dirty appearance. It also contributed to wetter soil in the barns. Each of these conditions can contribute to higher incidences of illness and infection.

Quantitative

During the trial, a water sample was analyzed to determine populations of total bacteria, as well as coliform bacteria. Only 2 colony forming units (CFU) per milliliter were detected of total bacteria, and zero cfu/ml of coliform bacteria were detected. Additionally, the average weight of each flock was measured at 8.60 and 8.61 pounds, which represents an increase of 0.89 and 0.90 pounds per bird from the previous control flock that did not receive treatment. Sold at an average price of $0.53/lb, the added weight could represent a revenue increase of up to $35,298.