AQUATIZE® May Ameliorate Bordetellosis Damage to Turkeys

A study* by Dr. S.L. Pardue and Dr. G.H. Luginbuhl at North Carolina State University published in the journal, *Avian Diseases*, explores the possibility that AQUATIZE®, a unique oxy-halogen water disinfectant, not only kills bacterial pathogens present in drinking water, but may also help animals overcome bacterial infection in distal organs.

The NC State scientists tested the ability of AQUATIZE® to ameliorate the damaging effects caused by *Bordetella avium* (BA, a causative agent of coryza) to turkeys. In the study, they purposefully infected young turkey poults with sublethal amounts of this bacterium and compared these to poults that were not infected. Poults were further subdivided into several groups and some groups received drinking water treated with AQUATIZE® whereas others received water without AQUATIZE®.

The researchers observed results that were promising for turkey growers: the AQUATIZE®-treated group exhibited “significantly lower” rates of BA compared to the controls. This translated into heavier birds in the AQUATIZE®-treated group and better feed conversion ration (FCR) which was described by the researchers as “significantly improved”. The symptoms of the BA, including damage to the tracheal epithelial, were “mild or absent” in the turkeys that received AQUATIZE®. (Results below).

**Body weights of *Bordetella avium* (BA)-infected turkey poults:**

<table>
<thead>
<tr>
<th></th>
<th>14 days old</th>
<th>17 days old</th>
</tr>
</thead>
<tbody>
<tr>
<td>No AQUATIZE®</td>
<td>262.8 g⁶</td>
<td>336.9 g⁶</td>
</tr>
<tr>
<td>1:2000 dilution AQUATIZE®</td>
<td>330.2 g⁴</td>
<td>436.3 g⁴</td>
</tr>
<tr>
<td>1:1000 dilution AQUATIZE®</td>
<td>333.5 g⁴</td>
<td>445.4 g⁴</td>
</tr>
</tbody>
</table>

**FCR of *Bordetella avium* (BA)-infected turkey poults:**

<table>
<thead>
<tr>
<th></th>
<th>1-7 days</th>
<th>8-14 days</th>
</tr>
</thead>
<tbody>
<tr>
<td>No AQUATIZE®</td>
<td>1.44⁶</td>
<td>1.33⁴</td>
</tr>
<tr>
<td>1:2000 dilution AQUATIZE®</td>
<td>1.20⁴</td>
<td>1.25⁴</td>
</tr>
<tr>
<td>1:1000 dilution AQUATIZE®</td>
<td>1.17⁴</td>
<td>1.20⁴</td>
</tr>
</tbody>
</table>

*Bordetella avium* causes the respiratory disease known as bordetellosis in all bird species and creates severe losses to the poultry industry worldwide --- especially in turkeys. This gram-negative bacterium attaches and damages the trachea of chickens and turkeys and is the same genus that causes whooping cough in humans. The infection itself does not directly cause death in birds, but infected chickens or turkeys may develop secondary infections which lead to increased mortality in the flock. Bordetellosis causes upper respiratory symptoms such as sneezing, nasal discharge, swelling of the sinuses, and lockjaw. Apparently multiple routes of infection can occur in commercial operations, but
one route of infection may be via the drinking water – a route that lends itself to
treatment with AQUATIZE®.

There are many problems that veterinarians face when trying to ameliorate the effects of
BA. First, the effectiveness of antibiotics is weak, which may be due to the fact that BA
colonizes the upper respiratory tract which is an area that is difficult to expose to
antibiotics. Second, vaccines have been used to treat the disease but in laboratory and
field tests the results have been “minimal to modest”. This poses a challenge to the
industry to find an effective treatment for bordetellosis.

This study is quite interesting because several producers have observed that the incidence
of such problems as air saculitis seems to be reduced in the chickens when AQUATIZE®
is present in the drinking water. In the study done in Avian Diseases, the AQUATIZE®
was included in the water which indicates that when the water was consumed by the
turkeys, the presence of AQUATIZE® led to a healthier bird that was able to interfere
with the BA pathogen’s ability to attach and damage to the trachea walls. The scientists
noted in their conclusion that “a novel oxy-halogen formulation (AQUATIZE®) has been
demonstrated as a potentially effective therapeutic agent for the treatment of
bordetellosis. The mechanism of action has not been fully elucidated.” Or, perhaps the
mechanism is as simple as providing the bird with clean, uncontaminated drinking water
spares the bird’s defense systems having to combat infectious agents at multiple sites and
consequently it more effectively prevents the BA from developing.

The observation of the NC State scientists should not be surprising to people who have
used AQUATIZE®, a powerful oxidizing agent that effectively kills at least eleven
pathogens, as listed on the label. It is logical to assume that AQUATIZE® is effective
against a wider range of other pathogens and studies like this confirm the anecdotal
accounts of AQUATIZE®’s ability to kill bacterial pathogens that infect poultry and
decrease profits for producers. With more pressure on the industry to cut back on
antibiotics --- and their near-ineffectiveness against BA --- AQUATIZE® is something
that many turkey producers are taking notice of.

**“Improvement of Poult Performance Following Bordetella avium Challenge by
Administration of a Novel Oxy-Halogen Formulation”

S. L. Pardue and G. H. Luginbuhl