

TECHNICAL SERVICE



BULLETIN



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AQUALYTE® IMPROVES PERFORMANCE OF BROILERS UNDER SUMMER CONDITIONS

A recent study, conducted by Dr. G. C. Harris, Jr., R. P. Rorie and L.B. Macy at the University of Arkansas-Fayetteville, indicates that **AQUALYTE®** tends to improve performance of broilers grown under typical summer conditions. The experiment was conducted during three weeks prior to processing. **AQUALYTE®**, a proprietary blend of electrolytes and trace minerals, increased the economic return from broilers exposed to mild heat stress when supplied in the drinking water at recommended levels during the final week, or at increasing levels throughout three weeks.

I. EXPERIMENTAL OBJECTIVES AND DESIGN

Previous research, conducted by Dr. Mark Cook at the University of Wisconsin, demonstrated that **AQUALYTE®** supplementation reduced mortality and improved the physiological response of turkeys exposed to extreme heat stress (TSB #257-E). Best results were seen in birds receiving **AQUALYTE®** for 7 days beginning just prior to periods of severe heat and humidity rather than following prolonged administration of the product during heat stress. These findings indicate that birds may adapt to long-term consumption of electrolyte-treated water. It was suggested that rotating or increasing concentrations of **AQUALYTE®** may help overcome this adaptation. Therefore, the Arkansas study examined three experimental treatments:

AQUALYTE® Supplied in Drinking Water (Times recommended level)

TREATMENT	WEEK 5	WEEK 6	WEEK 7
Control	0	0	0
AQUALYTE®-1 week	0	0	1
AQUALYTE®-Rotation	1	0	1
AQUALYTE®-Increasing	1	2	3

Birds were placed in battery pens in an 80°F environmental chamber during week 4 to acclimate to these facilities. Beginning week 5 through week 7 the environmental chamber was cycled from 80°F to 95°F (80°: 7 PM – 6 AM; 80° - 95°: 6 AM – 12 PM; 95°: 12 PM – 1 PM; 95° - 80°: 1 PM – 7 PM). Relative humidity was similarly cycled from 80% to 55%. This climate resulted in panting but not heat environmental conditions differed from those used in the Wisconsin study: humidity was lower; birds were exposed to daily high temperatures for shorter periods of time; the temperature cycle was maintained throughout the three weeks rather than increased at weekly intervals.

Birds received a finisher diet during week 3 through week 6, and a withdrawal diet during week 7, ad libitum. Water treatments began at week 5. Fresh water solutions were prepared daily. Individual bird weights and feed consumption were determined at the end of each week. Water consumption was measured each day.

II. EXPERIMENT RESULTS

Dramatic reductions ($P < .01$) in Feed/Gain were demonstrated during week 7 for all treatment groups receiving **AQUALYTE®**, with a tendency toward improved feed efficiency overall. Water consumption tended to increase when **AQUALYTE®** was administered, and was significantly greater ($P < .05$) during week 7 for birds receiving **AQUALYTE®**-1 week and **AQUALYTE®**-Increasing treatments, compared to controls. There was a strong negative correlation for Feed/gain and water consumption during week 7, which suggests that the improvement in feed efficiency for treatment groups receiving **AQUALYTE®** during this week was related to increased water intake.

Effects of **AQUALYTE®** Treatments on Performance of Broilers

ITEM	CONTROL	AQUALYTE® 1 WEEK	AQUALYTE® ROTATION	AQUALYTE® INCREASING
WEIGHT GAIN, LBS.	2.81	2.81	2.74	2.84
FEED INTAKE, LBS.	5.12	4.94	4.91	4.98
FEED/GAIN	1.83	1.76	1.80	1.74
WEEK 7	2.60 ^a	2.20 ^b	2.28 ^b	2.24 ^b
WATER CONSUMPTION, ML	6363	6466	6645	6674
WEEK 7	2267 ^c	2611 ^d	2448 ^{cd}	2628 ^d

^{ab} Means with different superscripts significantly different ($P < .01$).

^{cd} Means with different superscripts significantly different ($P < .05$).

III. ECONOMIC EVALUATION

An economic evaluation (per bird basis) was conducted by Dawe's Laboratories using these assumptions:

Cost of finisher feed = \$155/ton.

Cost of withdrawal feed = \$145/ton. ®

Cost of **AQUALYTE®** = \$.98/LB.

Value of live weight gain = \$.25/lb.

Treatment	Live Gain Value, \$	Feed Cost, \$	AQUALYTE® Cost, \$	Return \$	Benefit, \$
Control	.7020	.3881	---	.3139	---
AQUALYTE®- 1 Week	.7025	.3738	.0026	.3261	.0122
AQUALYTE®-Rotation	.6839	.3718	.0043	.3078	-.0061
AQUALYTE®-Increasing	.7106	.3766	.0145	.3195	.0056

While this analysis indicates that the greatest economic return was achieved by supplying AQUALYTE® during the final week only, gain and feed efficiency were greatest when increasing concentrations of AQUALYTE® were supplied in the drinking water throughout the three weeks.

IV. DISCUSSION

Dr. Harris notes that the improved performance by AQUALYTE®-treated broilers may have been due to increased water consumption during week 7. Increased water intake is beneficial since it replaces water lost through panting during heat stress.

Percentage shrink also tended to be reduced for birds receiving the AQUALYTE®-1 week and AQUALYTE®-Increasing treatments, following an 8 hour period without feed or water. Birds receiving the Control treatment had an average percentage shrink of 3.76%, while the percentage shrink was 3.62% and 3.33% for broilers receiving the AQUALYTE®-1 Week and AQUALYTE®-Increasing treatments, respectively. These improvements were seen even though birds did not receive AQUALYTE® for 15 hours prior to removal of feed and water. These findings agree with previous research by Dr. Robert W. Berg of the University of Minnesota who found reduced shrinkage for turkeys receiving AQUALYTE® for 48 hours prior to shipping (TSB #193-E).

Results of university research have led to the following recommendations for the use of AQUALYTE® by poultry producers during the upcoming summer months:

Typical summer conditions – Even though outside temperature and humidity may not be extreme, birds experience greater heat stress as their body size increases and they endure more crowded conditions. AQUALYTE® should be supplied to birds at least during the final week before processing to improve performance during this period. It may be economically advantageous to include AQUALYTE® in the drinking water for longer periods of time. However, increasing concentrations of the product should be supplied to prevent adaptation to AQUALYTE® during prolonged administration.

Severe heat and humidity - AQUALYTE® treatment should begin just before an expected heat wave, and continue for at least 7 days. If the periods of extremely high

temperature and humidity persist, the concentration of **AQUALYTE®** should be increased, stepwise, to two to three times the normal dose.

Contact the technical staff at Dawe's Laboratories USA for more information on how **AQUALYTE®** can be used as an effective part of your management of poultry during the hot summer months.

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