



Poultry Water Management During Hot Weather

by Dr. Chet Wiernusz, PhD

Water is the most important nutrient in animal nutrition. It plays an essential role related to body temperature regulation and mineral balance especially during times when birds are exposed to high ambient temperature and high humidity environments. Elevated water consumption by the heat stressed bird is critical. Its importance is underscored by the fact that heat stressed birds dissipate over 80% of their heat production via evaporative cooling primarily through respiration rate. Evaporative heat dissipation extent and the corresponding calories lost during panting are highly correlated with water consumption level and water balance. Birds in positive water balance are better able to maintain body temperature homeostasis. Managing birds for maximum evaporative cooling potential and calories dissipated per breath centers on water consumption.

Addition of various salts to the drinking water alters the bird's osmotic balance, increases water consumption and influences water balance. Salt water supplementation during heat stress has been demonstrated to improve performance and reduce serum corticosterone. Studies indicate that increased water consumption benefits the bird by acting as a heat receptor as well as increasing the amount of heat dissipated per breath. These thermobalance effects

are principally observed when water temperature falls at or below 82 F. Benefits on performance (growth rate, feed efficiency, survivability) are environment dependent. Each of these variables have been improved by focusing on water management during heat stress conditions.

Significant interactions exist between salt addition to drinking water and drinking water temperature. Data presented in Table 1, representing a three trial average (Teeter et al., 1987), indicate that potassium chloride drinking water fortification increased feed consumption and growth rate when the temperature of the consumed water was lower than the broilers body temperature. Addition of salt to drinking water with a similar temperature as the bird was without beneficial effect. However, lowering the water temperature without salt addition to stimulate water intake also proved to be beneficial. Indeed the effects of lowering drinking water temperature and salt addition were additive. Growth rate enhancements were due to the birds consuming more feed, which likely offset a portion of the hypothermic effect.

Boiler studies have shown that heat stress increases urinary excretion for potassium, sodium, zinc and molybdenum and increases fecal excretion for calcium, manganese, selenium and copper. Mineral retention for magnesium and phosphorous was reduced

AT A GLANCE

WATER MANAGEMENTPG 1

NEW HIRE.....PG2

***NutriQuest® NEWS is published when there is a topic warranting your attention. Our intention is to respect the value of your time and not bother you with topics of limited value.*

Look for the NutriQuest® Team in 2016

The NutriQuest® team continues to participate in many swine, dairy and poultry tradeshows and conferences throughout the year. We have compiled a list of events where our team will be present. Feel free to give us a call to arrange a meeting during one of these upcoming events.

WE LOOK FORWARD TO SERVING YOU!

JOINT ANIMAL SCIENCE MEETING

(July 19-23, Salt Lake City, UT)

AMERICAN ASSOCIATION OF AVIAN PATHOLOGIST

(August 6-9, San Antonio, TX)

VIRGINIA POULTRY HEALTH & MANAGEMENT SEMINAR

(August 10, Harrisonburg, VA)

POULTRY SYMPOSIUM FOR LIVE PRODUCTION

(August 30-31, Rogers, AR)

ARKANSAS NUTRITION CONFERENCE

(September 7-9, Rogers, AR)

Check out our new website:
www.nutriquest.com

Be sure to follow us on Facebook & Twitter!



by a combination of urinary and fecal excretion. Whether specific benefits, attributable to individual minerals, exist independently of water consumption has not been concretely established. The strongest evidence is that potassium based salt mixtures appear superior to sodium for broilers. Though this area is ripe with claims and short on fact, efficacious therapies will likely emerge with applications directed at acute stress, chronic stress and compensatory gain following stress periods. The majority of the studies regarding mineral water supplementation have been conducted with broilers. Broiler breeders will probably require a mineral supplementation that is unique to their needs.

Panting during heat stress is critical for body temperature maintenance. However, the increased respiration rate, necessary for evaporative cooling, also results in carbon dioxide loss and acid/base perturbations. Bird performance has increased following drinking water carbonation or supplementation with acids such as ammonium chloride and hydrochloric acid, suggesting that maintenance of carbon dioxide and/or blood pH is critical to growth rate. Most of the data suggest that the various drinking water supplementations alter growth rate primarily by forcing the bird to increase its water consumption.

Birds under heat stress conditions must make physiological adjustments. Depending upon the amount of stress feed intake will be depressed and performance will follow. Increasing water intake is a key to help mitigate some of these performance reductions.

Table 3. Effects of Water Temperature and Potassium Chloride effects on Heat Stressed Broilers¹
(from Teeter et al., 1987)

Water Temp (F)	ADG (G)		Daily Water Cons (ml)		Body Temp (F)	
	Control	+ .5% KCL	Control	+ .5% KCL	Control	+ .5% KCL
55	55.4 ^{ab}	60.2 ^a	364 ^b	470 ^a	109.0 ^{ab}	108.7 ^b
88	50.3 ^b	56.5 ^{ab}	359 ^{bc}	466 ^a	109.6 ^a	109.5 ^a
108	47.0 ^{bc}	42.5 ^c	364 ^b	340 ^c	109.9 ^a	109.6 ^a

¹Three trials combined

^{a-d}Means within a classification, with unlike superscripts differ (P<0.05).

NutriQuest Welcomes Director of Sales - Poultry

Mason City, IA – Shannon Burasco has joined NutriQuest as Director of Sales - Poultry and will manage the NutriQuest poultry sales effort in the United States, Canada and Mexico. Burasco will focus on promoting NutriQuest’s line of tailored water treatment systems and NutriQuest poultry-focused nutritional products. Prior to joining NutriQuest, Burasco most recently served as broiler/broiler breeder sales director for Diamond V and as President of CWT International. He has also worked with Aviagen, Elanco and Cobb-Vantress during his career. Burasco resides in Springdale, Arkansas.



Stay in the conversation, like us on Facebook and follow us on Twitter!

