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## ***BROILER TIP . . .***



### **LOW NIPPLE FLOW RATES: POOR BROILER PERFORMANCE**

How many times have we been in a broiler house and observed water dripping from nipple waterers or noticed water in the cup and assumed the birds were receiving an adequate supply of water? We really do not know if the nipple waterers are providing adequate water output to the birds – unless the actual flow rate of the nipple waterers is determined. Research from the USDA Poultry Laboratory Starkville, Mississippi reported that a reduction in water flow rate from 75 to 25 mL/min decreased final body weights by 0.50 lb and reduced breast meat yield by 14% (Miles et al. 2003). Having optimum flow rate could be the difference between a high performing and a below average flock.

Water is an important nutrient for poultry. At hatching, the broiler chick is comprised of approximately 85% water. Water is used for the transportation of nutrients, chemical reactions, osmotic balance, body temperature regulation, and lubrication of joints and organs. The relationship of water to feed consumption on commercial broiler farms has been determined to be 1.6:1 over the life of the flock, but the ratio does vary with increases in environmental temperature (Dozier et al., 2002).

Do we realize the amount of variation of water output among houses within a farm or from farm to farm since service personnel do not typically measure water flow rates on their routes? One of the biggest problems related to water in the broiler house is low nipple flow rate. The consequence of a low water flow rate is decreased feed consumption with a corresponding reduction in body weight. The recommended flow rate by the USDA Poultry Laboratory in Starkville, Mississippi (Miles et al., 2003) is 7 mL/min per week of age plus 20. For example, a 5 week-old broiler would need a flow rate of 55 ml/min (5 weeks of age x 7 + 20).

#### **Field Survey**

A field survey was conducted to examine water flow rates of nipple waterers among commercial broiler farms in Mississippi and Georgia (Lott et al., 2003). A water stick was used to determine flow rates of nipple waterers throughout the broiler house (Figure 1). Three to four nipples were tested per line with most houses having a total of eight lines. The stick was placed under the nipple and water was collected for 20 seconds. Water flow rate (mL/min) was determined by multiplying the amount of water obtained (mL) by three.

On a six-house broiler farm in Mississippi, house flow rates ranged from 154 mL/min to 44 mL/min. Other

#### **PUTTING KNOWLEDGE TO WORK**

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observations have indicated that it is not uncommon for extreme variation in flow rates to exist among houses on the same farm. Water flow rates were compared on two broiler farms (A and B) in Mississippi. Farm A had a flow rate of 30 mL/min, whereas water flow rate was 90 mL/min on Farm B. Final body weight was reduced by the low water flow rate (Farm A = 3.68 lb vs. Farm B = 3.90 lb). By the next flock, Farm A had increased the flow rate and the body weight was higher than Farm B at the end of the growout (Farm A = 3.74 lb vs. Farm B = 3.67 lb). Both farms were under the same management. Another comparison was conducted with two commercial broiler farms in Mississippi differing in water flow rates. Farm A had a flow rate of 20 mL/min, whereas the water flow rate on Farm B was 50 mL/min. Farm B had a higher final body weight and improved cumulative feed conversion (Farm A = BW – 3.74 lb; F/G – 1.98; Farm B = BW – 4.00 lb; F/G – 1.83).

In Georgia, low water flow rates also adversely affected bird performance. Two broiler farms were compared. The water flow rate for Farm A was 15 mL/min and Farm B had a water flow output of 70 mL/min. Final body weight was affected (Farm A = 4.35 lb vs. Farm B = 4.89 lb). In another field evaluation in Georgia involving two different farms, Farm A had a water flow rate of 25 mL/min and the water output on Farm B was measured as 75 mL/min. Again, the final body weight was decreased with the farm having a low water flow rate (Farm A = 4.36 lb vs. Farm B = 5.04 lb).

The bottom line: avoid low nipple flow rates. The nipple waterers in each house should be calibrated to provide optimum nipple flow rates once a year. During each growout, nipple flow rates should be checked at placement, three weeks, and six weeks of age. As the birds advance in age, the nipple flow rates should increase based on the equation (weeks of age x 7 +20).



**Figure 1. Water Stick Used to Determine Nipple Flow Rates**

#### References

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