Heat Stress in Layers

A research project at a private facility compared the effect of added sodium from sodium bicarbonate to S-Carb®, sodium sesquicarbonate, in layers. Evaluation of egg production, egg quality and layer performance were compared in two genetic strains and at three temperature levels. The temperatures were controlled in environmental rooms to be normal (21.1-26.7° C), warm (23.9-35° C), and hot (26.7-37.2° C). Layers were fed for 24 weeks, from 18 to 42 weeks of lay.

All of the diets were corn / soybean based. The analysis of the diets is shown in table 1. Values shown for sodium and chloride are from laboratory analysis, and potassium reflects the predicted value. Test diets were balanced for 50 meq additional sodium from either sodium bicarbonate or S-Carb® and 100 meq from S-Carb®. Due to the different sodium content of S-Carb® vs. sodium bicarbonate, 30.4% vs. 27%, less S-Carb® was required to meet the same sodium level.

Table 1: Dietary Electrolyte Balance

	Control	50 meq Bicarb	50 meq S-Carb®	100 meq S-Carb®
DEB meq/kg	176	219	232	275
Sodium (%)	0.17 %	0.19 %	0.20 %	0.30 %
Potassium (%)	0.71 %	0.71 %	0.71 %	0.71 %
Chloride (%)	0.28 %	0.16 %	0.13 %	0.13 %
Added bicarb or S-Carb source %	0	0.41 %	0.36 %	0.72 %

There were no significant interactions on the variables shown in table 2 and temperature. Hens fed higher electrolyte diets produced slightly fewer eggs than the control hens. These treatments also had slightly higher mortality rates. There may have been some impact of the very low chloride levels in the S-Carb® treatments. The NRC recommends a minimum of 0.15% chloride, and these diets are below that threshold.

The percent breakage of the eggs was reduced with added sodium bicarbonate or S-Carb®. This is also confirmed with the specific gravity analysis. The addition of sodium bicarbonate improved specific gravity indicating thicker egg shells. S-Carb® also improved specific gravity slightly more than the sodium bicarbonate at equal sodium levels, and even more at the high addition Intake in the 100 meq S-Carb® treatment was significantly higher than other treatments.