

Micronutrients

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TBCC Notes

Technical Information for Users of *Micronutrients TBCC*[®]

The Impact of Copper on Poultry Production Economics

Copper is widely used to improve production economics in pigs and considerable supportive research has been published. By contrast, there has been very little published work in poultry to reveal the impact of copper on weight gain, feed conversion or carcass characteristics. The lack of good data leads to considerable variation in industry practice.

One published study (Pesti, G. M. and R. I. Bakelli, 1996. Poultry Sci. 75:1086-1091) showed that copper both improved live production efficiencies and reduced cholesterol in breast meat. The response continued through the last week of growth.

Several major integrated poultry producers had done research in their private facilities and concluded that *Micronutrients TBCC*[®] (TBCC) improved their results, but specific data were not available. For this reason, Micronutrients participated in sponsoring two studies in broiler chickens. They were designed to reveal any response from higher dietary copper levels and to compare TBCC to copper sulfate.

Copies of the complete reports on these studies are available upon request. The following brief summaries highlight key findings.

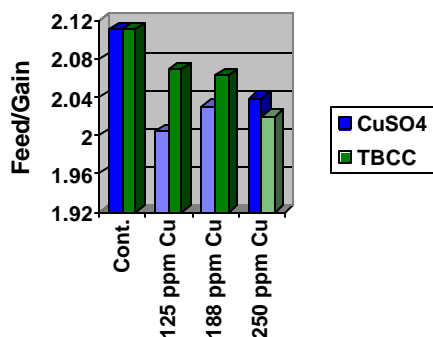
The “Challenge Litter” Trial

This work was done at Virginia Scientific Research, Inc., Harrisonburg, VA and completed in December 1996. It involved 6,048 chickens in a seven week feeding cycle with seven treatments x twelve replications. Used litter from a previous flock of birds was used with no top dressing in an attempt to reveal any possible differences between copper sources in control of mold in the litter. Unfortunately, the mold counts on samples of litter were widely scattered so that no differences between controls and either copper source could be determined.

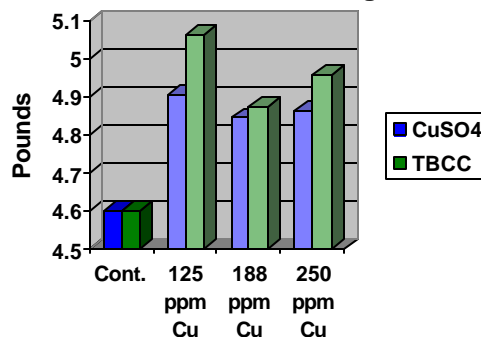
The moist litter combined with a relatively high stocking density to reduce overall live performance (feed conversions of 2.0 to 2.1 at 7 week bird weights of 4.6 to 5.1 lb.). Standard deviations on bird performance data were also high, requiring eight points of feed conversion to achieve the threshold of statistical significance.

Despite these difficult conditions, some interesting observations emerged. All combinations of copper source/level significantly improved weight gain compared to controls. On feed conversion, there was a clear trend indicating copper improves this key component of production economics.

Seven Week Feed Conversion



Seven Week Bird Weight



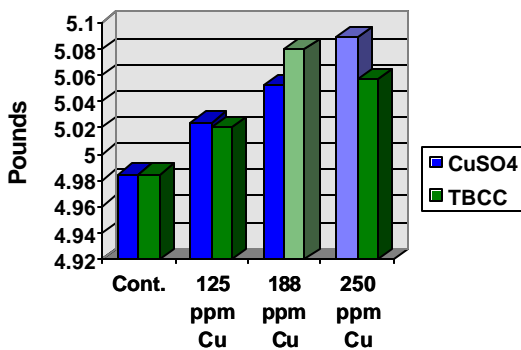
All combinations of copper source/level were at least four points lower than the control birds and three were better with statistical significance (indicated by striped bars).

“Commercial” Trial

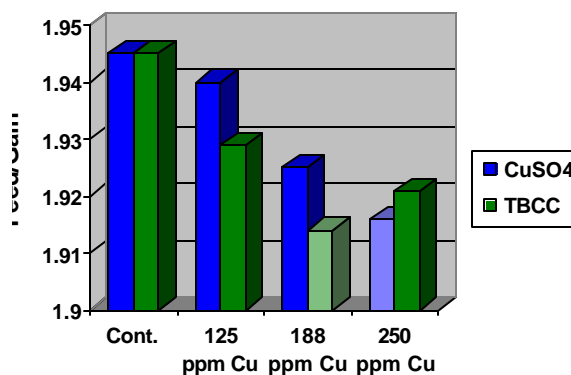
A second research trial was run in the spring of 1997 at PARC Institute, Easton, MD. This study used litter conditions and stocking density more closely reflecting commercial practice. 3,136 chickens were fed for seven weeks. The same treatments as in the earlier trial were used with eight replications. Overall bird performance was better and the data were tight and consistent. Feed conversion differences were statistically significant at three points and the trends were clearly evident even when below the level of significance.

Weight gain and feed conversion were both significantly better than the control birds for 188 ppm copper from TBCC and 250 ppm copper from copper sulfate.

Seven Week Bird Weight



Seven Week Feed Conversion



Conclusions

- Copper improves broiler performance under both disease stress and “healthy” conditions. These studies show feed conversion improvements of at least three points. Savings from conversion improvements as small as one point are large compared to the cost of copper.
- The improvement response to copper increases up to 250 ppm Cu from sulfate (2.0 pounds copper sulfate / ton) and 188 ppm from TBCC (0.64 pounds TBCC / ton). In both studies the response to copper continued in the grower stage.
- Optimum bird performance is obtained at 188 ppm Cu from TBCC. 33% more copper is needed from the sulfate salt to get equivalent results.
- When copper levels are limited, as under Canadian regulations, 125 ppm from TBCC gives as much improvement in conversion efficiency as 188 ppm from sulfate.