GemStone®

Technical Bulletin

Information from Phibro Technical Services

Effect of Various Zinc Sources on Broiler Live Performance, Bone Ash and Mortality

Executive Summary

- GemStone® (20 ppm added Zn from ***GemStone***) significantly improved feed conversion compared to the negative control and numerically improved feed conversion compared to the postive control (zinc sulfate) (Figure 1).
- ***GemStone*** (40 ppm added Zn from ***GemStone***) improved feed conversion compared to both negative and postive controls (zinc sulfate) (Figure 2).
- ***GemStone*** (40 ppm added Zn) increased bone ash percentage compared to controls.
- ***GemStone*** had similar improvements to performance as other organic trace minerals (OTM) zinc sources.
- All 40 ppm OTM treatments numerically outperformed their 20 ppm counterparts.

Materials and Methods

- 7,200 Ross 708, mixed-sex broiler chicks
- 50 birds/pen; 12 pens per treatment
- Fed commercial-type mash feed
    - Starter: d 0 to 21
    - Grower: d 22 to 42
    - Finisher: d 43 to 49
- Body weight and feed consumption measured at d 21, 42 & 49
- Bone ash, hock disorders and coccidial lesion scores determined at d 21 & 49

Treatments

- Negative Control (NC): 100 ppm added Zn from sulfate source
- Positive Control: NC plus 40 ppm added Zn (totaling 140 ppm Zn) from sulfate source
- ***GemStone***: NC plus 20 or 40 ppm added Zn from ***GemStone*** Zn
- OTM A: NC plus 20 or 40 ppm added Zn from zinc amino acid complex
- OTM B: NC plus 20 or 40 ppm added Zn from zinc proteinate

- OTM C: NC plus 20 or 40 ppm added Zn from zinc HMA
- OTM D: NC plus 20 or 40 ppm added Zn from zinc polysaccharide complex

Results

Figure 1. Broiler performance fed various zinc sources (20 ppm additional organic zinc) from 0 – 49 days of age.

Results for Negative Control + 20 ppm Zn Diets							
Variable	Negative Control	Positive Control	***GemStone*** Zn	OTM A	OTM B	OTM C	OTM D
Average Body Weight (g)	2666.8^{B}	2694.7^{A}	2693.6^{A}	2694.2^{A}	2687.2^{A}	2683.9^{A}	2693.8^{A}
Average Body Weight Gain (g)	2618.0^{B}	2645.9^{A}	2644.5^{A}	2645.5^{A}	2638.6^{A}	2634.9^{A}	2644.6^{A}
Feed:Gain (g/g)	1.953^{A}	1.925^{B}	1.905^{B}	1.926^{B}	1.929^{B}	1.932^{B}	1.919^{B}
Bone Ash (%)	40.4^{B}	41.2^{AB}	40.7^{AB}	41.6^{A}	41.6^{A}	40.9^{AB}	41.5^{A}
Mortality (%)	No significant differences. Bird Mortality was already low at 0.5% or less						

Means with different superscripts differ ($P < 0.05$)

Figure 2. Broiler performance fed various zinc sources (40 ppm additional organic zinc) from 0 – 49 days of age.

Results for Negative Control + 40 ppm Zn Diets							
Variable	Negative Control	Positive Control	***GemStone*** Zn	OTM A	OTM B	OTM C	OTM D
Average Body Weight (g)	2666.8^{B}	2694.7^{AB}	2730.4^{AB}	2734.9^{A}	2720.4^{AB}	2723.4^{AB}	2730.8^{A}
Average Body Weight Gain (g)	2618.0^{B}	2645.9^{AB}	2681.4^{AB}	2686.2^{A}	2671.4^{AB}	2674.5^{AB}	2682.0^{A}
Feed:Gain (g/g)	1.953^{A}	1.925^{B}	1.885^{CD}	1.879^{D}	1.898^{CD}	1.901^{C}	1.879^{D}
Bone Ash (%)	40.4^{B}	41.2^{B}	43.2^{A}	43.2^{A}	43.7^{A}	43.3^{A}	43.0^{A}
Mortality (%)	No significant differences. Bird Mortality was already low at 0.5% or less						

Means with different superscripts differ ($P < 0.05$)

This information has been prepared for industry technical professionals only and may be presented and discussed with them only upon request.