



# **Technical Bulletin**

Information from Phibro Technical Services

# Zinc Sulfate and Manganese Sulfate Titrated with Additions of GemStone® Zn and **GemStone** Mn

## **Executive Summary**

- For body weight gain, the 30 and 40 ppm each of **GemStone** Mn and Zn treatments significantly (P < 0.05) out-performed both negative (100 ppm each of Mn and Zn from sulfates) and positive (140 ppm each of Mn and Zn from sulfates) controls (Figure 1).
- Feed conversion was also significantly improved (P < 0.05) by the 30 and 40 ppm each of **GemStone** Mn and Zn compared to the negative control but not the positive control (Figure 2).
- For coccidial lesion scores, 40 ppm each of **GemStone** Mn and Zn significantly decreased lesion scores (P < 0.05) when compared to the same Mn and Zn mineral supplementation rates of inorganic sulfates (Figure 3).

#### **Materials and Methods**

- 3,000 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 and coccidial lesion scores determined at d 42 & 49

#### **Treatments**

- Negative Control (NC): 100 ppm added Zn and 100 ppm added Mn from sulfate sources
- Positive Control: NC plus 40 ppm added Zn and 40 ppm added Mn (totaling 140 ppm Zn and 140 ppm Mn) from sulfate sources
- NC plus 20 ppm OTM: NC plus 20 ppm added Zn and 20 ppm added Mn from GemStone Zn and GemStone Mn
- NC plus 30 ppm OTM: NC plus 30 ppm added Zn and 30 ppm added Mn from GemStone Zn and GemStone Mn
- NC plus 40 ppm OTM: NC plus 40 ppm added Zn and 40 ppm added Mn from GemStone Zn and GemStone Mn





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### Results

Figure 1. Average daily gain of broiler chicks fed various zinc and manganese sources from 0 – 49 days of age.

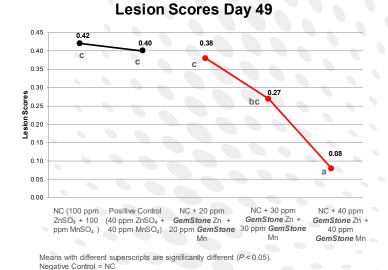
#### Day 0-49 Average Body Weight Gain (g) 2,720 2.700 2,700 **3** 2,680 E 2,660 ab 2 647 bcd 2.640 2,620 Average 2,600 2,580 2,560 NC (100 ppm Positive Control ZnSO<sub>4</sub> + 100 ppm (140 ppm ZnSO<sub>4</sub> + 140 ppm MnSO<sub>4</sub>) NC + 20 ppm NC + 30 ppm NC + 40 npm GemStone Zn 30 ppm GemStone 40 ppm GemStone 20 ppm GemStone

Means with different superscripts are significantly different (P < 0.05).

Figure 2. Feed conversion of broiler chicks fed various zinc and manganese sources from 0 – 49 days of age.

#### **Day 0-49 Feed Conversion Corrected** 1.98 1.96 1.919 <u>হ</u> 1.92 ab 5 1.90 1 899 1.88 а 1.86 1.84 NC + 20 ppm NC + 30 ppm NC + 40 ppm NC (100 ppm Positive Control ZnSO<sub>4</sub> + 100 GemStone Zn -GemStone Zn + GemStone Zn + (140 ppm ZnSO<sub>4</sub> -30 ppm GemStone Mn 40 ppm GemStone Mn ppm MnSO<sub>4</sub> ) 140 ppm MnSO<sub>4</sub>) 20 ppm GemStone Means with different superscripts are significantly different (P < 0.05). Negative Control = NC

Figure 3. Coccidial lesion scores of broiler chicks fed various zinc and manganese sources from 0 - 49 days of age



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

