



Study Objective

Evaluate the efficacy of feeding Availa-Zn, Availa-Z/M and Availa-Z/MC on performance and bone health of male turkey poult

Study Duration

Study 1:
0 to 50 days

Animals

Study 1:
1,200 day old male Hybrid Converter turkey poult

Location

University of Missouri,
Columbia, USA

Birds housed in 40 ft² concrete floor pens containing 5" of dry clean pine wood shavings within an environmentally controlled facility

Research Brief

Effects of Availa-Zn, Availa-ZM, and Availa-ZMC on Performance of Male Turkey Poults

Study 1

Treatments

The four dietary treatments were supplemented to obtain 125,125, 7 mg/kg of Zn, Mn and Cu; respectively. T1: Sulfates; T2: 60 ppm Zn from Availa-Zn + 65 ppm Zn from ZnSO₄; T3: 40 ppm Zn and 40 ppm Mn from Availa-Z/M + 85 ppm Zn from ZnSO₄ and 85 ppm Mn from MnSO₄; and T4: 40 ppm Zn, 40 ppm Mn, and 7 ppm Cu from Availa-Z/MC + 85 ppm Zn from ZnSO₄ and 85 ppm Mn from MnSO₄. The different dietary treatments were added to a standard turkey diet program from 0 to 50 days of age.

Procedure

Complete Randomized Design with 4 dietary treatments, 12 replicates per treatment, 25 birds/ replicate. Data were analyzed by one-way ANOVA. Statements of statistical significance were based upon $P < 0.10$.

- Body gain (BWG), Feed intake (FI), Feed conversion ratio adjusted to mortality (FCR) were measured at 7, 19 and 50 days of age
- Tibias from turkeys at 50 days of age were sampled and analyzed for ash and TM content
- Measurements of the proximal tibia growth plate layer and histology were performed

Results

Turkey poults fed Availa-Zn, Availa-ZM or Availa-Z/MC from 0 to 50 days of age had numerical increase in BW gain (Figure 1) and improved FCR ($P = 0.06$) compared with poults fed sulfate sources of trace minerals (Figure 2).

Tibia ash percentage of birds fed sulfates and Availa-Zn and Availa-Z/M was greater ($P = 0.04$) than those consuming Availa-Z/MC, whereas tibia ash as a percent of BW was not different ($P > 0.2$) (Figure 3). No histomorphometric differences were observed for the tibias at 50 days.

Conclusions

- Birds consuming supplemental trace mineral amino acid complexes were observed to have statistically improved FCR and numerically better BWG
- Improving first weeks' general health conditions represents an opportunity for turkey production. Intestinal health, immune response and skeleton development are closely related. Feeding Zinpro Performance Minerals (ZPM) represent an opportunity to support those important systems and tissues, with substantial Return of Investment (ROI) on FCR over sulfate supplementation

Figure 1.

Body Weight Gain of Poults to 50 Days

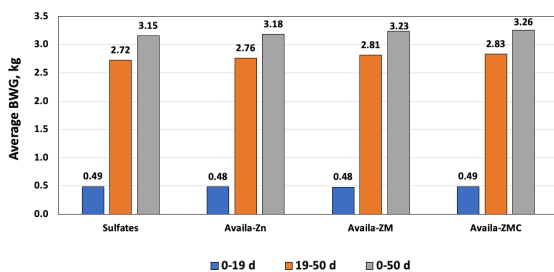


Figure 2.

Feed Conversion Ratio of Poults to 50 Days

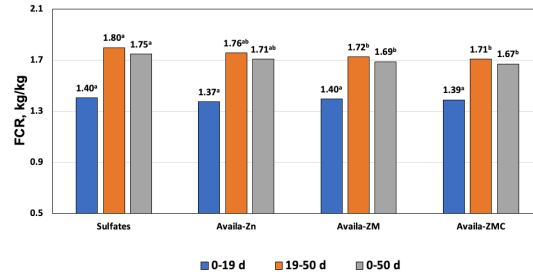


Figure 3.

Percent Tibia Ash/kg BW

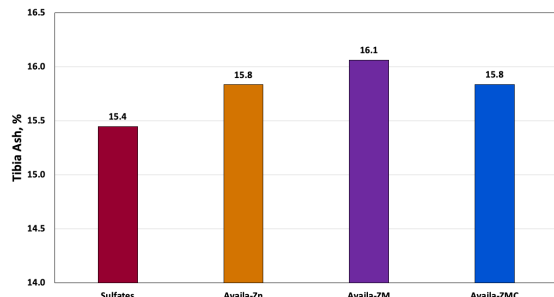


Table 1.

ROI Calculation Over Sulfates - Calculated for Feeding 50,000 Turkeys

\$335.00 per MT	Control	Availa-Zn	Availa-Z/M	Availa-Z/MC
FCR results of the trial	1.745	1.707	1.688	1.669
FCR advantage (points) in the trial	n/a	3.82	5.73	7.63
Cost of 1 point of FCR/MT of feed produced	1.968	1.968	1.968	1.968
Cost to add ZPM (\$/MT)	n/a	1.90	2.72	3.05
Profit of FCR advantage (cost of MT saved)		2051	3076	4096
Cost to include ZPM based on MT needed		520	736	816
ROI Calculation over Sulfates		3.95	4.18	5.02
MT of feed (BW x FCR x 50,000)	279.6	273.5	270.5	267.4
MT differential (from improved FCR)	n/a	6.12	9.18	12.23



Study Objective

Evaluate the efficacy of feeding Availa-Zn, Availa-Z/M and Availa-ZMC on performance and bone health of male turkey poult to 13 weeks of age.

Study Duration

Study 2:
0 to 13 weeks

Animals

Study 2:
1,248 day old male Hybrid Converter turkey poult

Location

University of Missouri,
Columbia, USA

Birds housed in 40 ft² concrete floor pens containing 5" of dry clean pine wood shavings within an environmentally controlled facility

Research Brief

Effects of Availa-Zn, Availa-ZM, and Availa-ZMC on Progeny Performance of Male Turkey Poults, from Turkey Breeders Fed Availa-ZMC

Study 2

Treatments

Turkey breeders were fed inorganic minerals (IM) or Availa-ZMC with 40, 40, 7 ppm of Zn, Mn, and Cu; respectively on top of IM treatments; and four Starter-Grower 1 dietary treatments were supplemented to obtain 125-, 125-, 7 mg/kg of Zn, Mn and Cu; respectively. T1: Sulfates; T2: 60 ppm Zn from Availa-Zn + 65 ppm Zn from ZnSO₄; T3: 40 ppm Zn and 40 ppm Mn from Availa-Z/M + 85 ppm Zn from ZnSO₄ and 85 ppm Mn from MnSO₄; and T4: 40 ppm Zn, 40 ppm Mn, and 7 ppm Cu from Availa-ZMC + 85 ppm Zn from ZnSO₄ and 85 ppm Mn from MnSO₄. The different dietary treatments were added to a standard turkey diet program from 0 to 49 days of age. Grower 2 diets from 50 to 70 days of age were reduced by 25 ppm Zn and Mn from sulfates for all treatments based on starter diet levels; Finisher diets from 71 to 91 days of age were reduced by 50 ppm Zn and Mn from sulfates for all treatments of based on starter diet levels.

Procedure

Randomized Factorial Design with Blocks: with 2 Breeder treatments x 4 Progeny treatments. Data were analyzed using PROC Mixed procedure, mean differences analyzed by LSD test, statements of statistical significance were based upon $P < 0.10$

- BW, FI, FCR were measured at 7, 21, 49, 70, and 91 days of age
- Tibias from turkeys at 112 days of age were sampled and analyzed for ash and TM content
- Measurements of the proximal tibia growth plate layer and histology were performed

Figure 1. Body Weight Gain of Poults 0 to 13 weeks

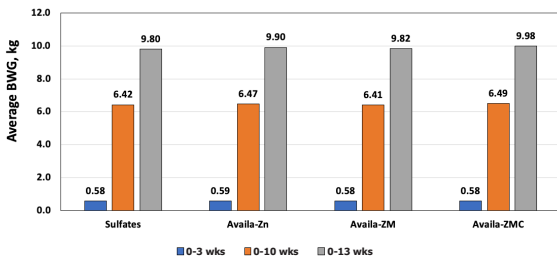
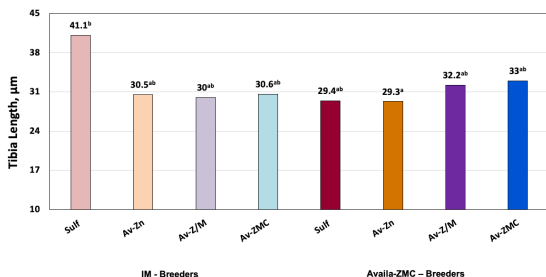


Figure 3. 112-day Tibia Proliferative Zone Length (40x)



Results

A performance effect from 0 to 13 weeks of age ($P = 0.02$) occurred, where poults from Breeders treated with Availa-ZMC had lower FCR than poults of Breeders fed IM (2.243 vs 2.287).

Turkey poults fed Zinpro Performance Minerals from 0 to 13 weeks of age had numerically better BW gain (Figure 1) and improved FCR ($P = 0.07$) than poults fed sulfate sources of trace minerals (Figure 2).

There was no difference ($P > 0.05$) in tibia weight and ash among Breeder or Progeny treatments.

Histological analysis of the tibia noted presence of rickets, suggesting changes shown as increased length of proliferative zone of growth plates, which was lower in turkeys fed Availa-Zn from Breeders fed Availa-ZMC ($P < 0.05$) (Figure 3).

Conclusions

- Feeding supplemented trace mineral amino acid complexes to turkey breeders impacted progeny bone characteristics and performance throughout the experimental period, compared to progeny of breeders fed inorganic minerals
- Economically, feeding Zinpro Performance Minerals (ZPM) offer substantial Return of Investment (ROI) on FCR over sulfate supplementation

Figure 2. Feed Conversion Ratio of Poults from 0 to 13 weeks

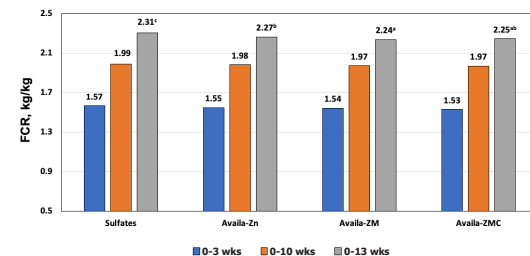


Table 1. ROI Calculation Over Sulfates - Calculated for Feeding 50,000 Turkeys

\$264.66 per MT	Control	Availa-Zn	Availa-Z/M	Availa-ZMC
FCR results of the trial	2.306	2.265	2.240	2.248
FCR advantage (points) in the trial	n/a	4.085	6.640	5.845
Cost of 1 point of FCR/MT of feed produced	1.142	1.142	1.142	1.142
Cost to add ZPM (\$/MT)	n/a	1.90	2.72	3.05
Profit of FCR advantage (cost of MT saved)		5317	8559	7522
Cost to include ZPM based on MT needed		2109	2985	3360
ROI Calculation over Sulfates		2.52	2.87	2.24
MT of feed (BW x FCR x 50,000)	1129.94	1109.85	1097.6	1101.52
MT differential (from improved FCR)	n/a	20.09	32.34	28.42