

RESEARCH NOW

Addition of Availa®Zn Improved Immune Response, Eggshell Quality and Hatching Egg Production in Broiler Breeders

Introduction:

Zinc amino acid complex has been shown to have increased bioavailability when compared to inorganic sources of zinc and have a positive effect on reproduction and immune status. This experiment was conducted to look at long-term effects of zinc source on reproduction.

Results:

Availa-Zn + ZnSO₄ treatment significantly improved the following parameters:

- Less cracked eggs (P<0.05)
- Increased hen day production (P<0.05)
- Increased hatching egg production per hen housed (P<0.05)
- Increased chick production (P<0.05)

Availa-Zn treatment increased Newcastle disease antibody titer levels (P<0.05)

ZnSO₄ treatment had the following effects:

- Lowest egg specific gravity (P<0.05)
- Lowest wattle swelling immune response (P<0.05)

Trial Design:

- Cobb 500 slow-feathering hens used
- Hens fed 1 of 3 diets from 0-65 weeks of age.
- At wk 20 all hens were caged (2/cage) and 16 hr light/day provided

Treatments:

- 160 ppm zinc from ZnSO₄ (ZnSO₄)
- 160 ppm zinc from Availa-Zn (Availa-Zn)
- 80 ppm zinc from Availa-Zn + 80 ppm zinc from ZnSO₄ (ZnSO₄ + Availa-Zn)

Conclusion:

Data from this experiment indicate that additions of Availa-Zn to broiler breeder diets enhanced immune response, shell quality and hatching egg production. Hens fed ZnSO₄ + Availa-Zn generally had superior performance.



ABSTRACT

66 Effect of Dietary Zinc Source on Reproductive Performance and Immune Status of Broiler Breeder Hens. B. P. Hudson^{*1}, W. A. Dozier, III¹, J. L. Wilson¹, J. E. Sander², and T. L. Ward³.

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Zinc amino acid complex has been shown to have increased bioavailability when compared to inorganic sources of zinc. Furthermore, short-term studies with broiler breeders have reported that dietary zinc amino acid complex affects reproduction and immune status. This experiment was conducted due to limited data regarding the long-term effects of zinc source on reproduction. Cobb 500 slow-feathering hens were given one of three diets from 0 to 65 wk. All experimental diets consisted of 160 ppm supplemental Zn from ZnSO₄, Availa®Zn zinc amino acid complex (ZnAA), or a mixture of ZnSO₄ and ZnAA (ZnSO₄+ZnAA, 80 ppm Zn from each). At 20 wk, all birds were caged (2 per cage) and 16 hr light per day was provided. Egg weights and specific gravity were measured every four wk starting at 26 wk. Eggshell breaking strength was measured at 50, 58 and 66 wk. Egg production, percentage cracked and hatching eggs were determined weekly. Hens were artificially inseminated, and eggs were incubated and hatched weekly (25-35 wk), biweekly (37-45 wk) or every fourth wk (49-65 wk). To assess immune status, hemagglutination inhibition titers to Newcastle disease virus (NDV), phytohemagglutinin (PHA)-induced wattle swelling and footpad scores were determined. Hens fed ZnSO₄+ZnAA expressed the lowest incidence of cracked eggs (ZnSO₄=8.0%, ZnAA=7.3%, ZnSO₄+ZnAA=6.6%, P<0.05), highest hen-day egg production (ZnSO₄=56.6%, ZnAA=56.7%, ZnSO₄+ZnAA=57.3%, P<0.05), greatest hatching egg production per hen housed (ZnSO₄=137, ZnAA=138, ZnSO₄+ZnAA=140, P<0.05) and highest chick production (ZnSO₄=106, ZnAA=105, ZnSO₄+ZnAA=109, P<0.05). Hens fed ZnSO₄ had the lowest specific gravity (ZnSO₄=1.079, ZnAA=1.080, ZnSO₄+ZnAA=1.080, P<0.05). Cellular immune response to PHA injection was enhanced as dietary ZnAA increased (P<0.05). Antibody titers to NDV were greatest for the ZnAA treatment (P<0.05). Hen-housed egg production, mortality, egg weight, eggshell strength, fertility, hatchability and footpad score were not influenced by zinc source. Data from this experiment indicate that additions of Availa®Zn to broiler breeder diets enhanced immune response, shell quality and hatching egg production; and hens fed ZnSO₄+Availa®Zn generally had superior performance.

Key Words: Dietary zinc source, Broiler breeder hen performance, Immune response, Eggshell quality

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