



Vaccination with Coccivac®-B Renews Sensitivity of Coccidial Population to Salinomycin

Coccivac-B vaccine is a live, sporulated oocyst vaccine produced from isolates that were collected by Dr. Alan Edgar (Auburn University) in the late 1940's, before the current anticoccidial products were introduced. Unlike present-day field oocysts, these isolates had never been subjected to selection pressure by anticoccidials resulting in resistance.

Previous studies by Dr. H. D. Chapman, University of Arkansas demonstrated that vaccination with Coccivac-B vaccine was sufficient to restore sensitivity of the house coccidial population to monensin (1994 Poultry Science 73: 476 - 478).

Key Points

- ➔ Prior to vaccination with Coccivac-B vaccine, the field oocysts showed significant resistance to 60 ppm of salinomycin with low weight gain and significant lesion scores.
- ➔ Following vaccination with Coccivac-B vaccine the resistance of the oocysts to 60 ppm of salinomycin was dramatically reduced. Weights and lesion scores were similar to birds challenged with oocysts isolated from farms with a long history of Coccivac-B vaccination and minimal coccidiostat resistance.
- ➔ Recent heavy usage of salinomycin has promoted the development of salinomycin-resistant field strains. Coccivac-B vaccine is a valuable tool to restore the performance of existing anticoccidials.

Using a similar technique, Dr. Harry Danforth (USDA-ARS, Beltsville, MD) tested samples from a farm before and after vaccination with Coccivac-B vaccine. The farm had a long history of ionophore and chemical coccidiostat use, but had never been vaccinated. Most recently, salinomycin had been used in combination with 3-nitro.

Methods

One-day-old Ross X AA male broilers were placed in floor pens and fed salinomycin at 60 ppm for 2 1/2 weeks. At 10 days of age, the birds were divided into groups and challenged by gavage with oocysts isolated from litter collected from farms with the following treatments:

- a. Field isolate from Complex A before vaccination with Coccivac-B vaccine.
- b. Field isolate from Complex A after vaccination with Coccivac-B vaccine.
- c. Field isolates from Coccivac-B Farms which had been vaccinated with Coccivac-B vaccine for at least 3 consecutive flocks.

The oocysts were isolated from litter, passaged in chickens and an effective challenge dose was determined based on the ability of the oocysts to induce poor weight gain in unmedicated control birds.

The birds continued to be fed salinomycin at 60 ppm. At 6 days post-challenge, weight gain and lesion scores were measured. Lesion scores were based upon the Johnson and Reid system.

Weight gain in birds challenged with the oocysts from the before- and after-vaccination farm were compared to weight gain in birds challenged with the oocysts from farms with a long history of Coccivac-B use.

Lower weight gain or higher lesion scores indicate greater oocyst resistance to salinomycin.

Results Lesion Scores

Midwest/West Complex A farm	Upper intestine	Middleintestine	Ceca
<i>Before Vaccination with Coccivac-B</i>	0.867	1.467	3.138
<i>After Vaccination with Coccivac-B</i>	0.380	0.070	0

Weight Gain Before Coccivac-B vaccination

Farm Oocyst Test Group	Challenged Birds fed 60 ppm salinomycin	% Reduction in the weight gain vs. Coccivac-B test farms	No. of days of gain lost during study
Coccivac-B test farms	205.97 ¹ gm	0	0
Complex A Farm Before Vaccination with Coccivac-B	165.43 ¹ gm	19.7%	1.38

Weight Gain After Coccivac-B vaccination

Farm Oocyst Test Group	Challenged Birds fed 60 ppm salinomycin	% Reduction in the weight gain vs. Coccivac-B test farms	No. of days of gain lost during study
Coccivac-B test farms	223.60 ¹ gm	0	0
Complex A Farm After Vaccination with Coccivac-B	218.10 ¹ gm	2.5%	0.18

¹ Weight gain over the 6-day test period following challenge.

Conclusions

These results confirm Dr. Chapman's findings: vaccination with Coccivac-B vaccine can renew the sensitivity of the on-farm coccidial population to an ionophore (salinomycin in this case).

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