

Comparative Study on the Efficacy of Diclazuril and Amprolium in Naturally Infected Broilers in Uganda

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Key words

Poultry - Broiler chicken - *Eimeria* - Amprolium - Anticoccidial - Uganda.

Summary

The efficacy of two synthetic anticoccidial drugs (amprolium and diclazuril) was studied in naturally infected broiler chickens in Uganda. The drugs were administered orally in drinking water. Oocyst counts indicated the level of infection. Both drugs were effective in controlling coccidia, although diclazuril was superior in reducing oocyst excretion. Diclazuril administered by oral route as opposed to in the feeds, the usual way, was effective. There were no weight gain differences between the treated and the control groups of the broilers up to the age of slaughter.

INTRODUCTION

Coccidiosis is a protozoan disease caused by parasites of the genus *Eimeria*. It is a major disease in commercial poultry production in Uganda as well as in other countries. Seven species with different degrees of pathogenicity are recognized in chickens: *E. acervulina*, *E. brunetti*, *E. maxima*, *E. mitis*, *E. necatrix*, *E. praecox* and *E. tenella* (4). While *E. tenella* causes cecal coccidiosis, the rest are known to cause intestinal coccidiosis.

In developed countries, coccidial infections are mainly controlled by prophylactic in-feed medication. In the case of Uganda, coccidiosis is mainly controlled by medication through drinking water. The classes of drugs used in the control of coccidiosis include synthetic compounds (amprolium, diclazuril, nicarbazin) and ionophores (monensin, salinomycin, maduramicin). Ugandan farmers commonly use synthetic compounds of amprolium with the conventional water-drinking methods. Despite the widely used anticoccidial drugs throughout the rearing period of broiler chickens, the literature on the efficacy of such drugs is scarce in Uganda. An in-feed-based Chinese anticoccidial, Qiu Jia[®] (diclazuril), was recently introduced in the country (pers.

commun.). The objective of this experiment was to compare the efficacy of two types of commonly used water-based amprolium drugs with Qiu Jia[®].

MATERIALS AND METHODS

Fifty day-old Hubbard chicks were obtained from a local hatchery. They were all reared on a floor with a deep litter of coffee husk, which had been covered with litter taken from floor-pens where *Eimeria* species had been previously diagnosed. The chicks were given broiler mash and water *ad libitum* throughout the experiment.

Fecal samples were weekly and randomly collected from ten chicks to assess the levels of coccidial infection. When the number of oocysts per gram (OPG) reached a mean of 1500 at approximately two weeks of age, the birds were randomly divided into four groups of 12 birds each and wing-tagged before treatment. The birds were not treated before this period (two weeks) in order to allow them to pick up sufficient oocysts to develop clinical coccidiosis.

Treatment regime

Group I chickens were treated with Coccid[®], an amprolium-based compound, according to the manufacturer's recommendation of 5 g into 5 l of drinking water for five days. Group II chickens were treated with Coccicontrol[®], also an amprolium-based compound,

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at the recommended dose of 10 g in 8 l of drinking water for five days. Group III chickens were given Qiu Jia[®] at the recommended dose of 25 g in 5 l of drinking water for five days. Group IV chickens were not given any anticoccidial throughout the experiment and were kept as controls.

Sampling and measurements

Early in the morning soon after feeding, samples of freshly dropped feces were collected from each bird and kept in a labeled container. Each bird was also weighed. The fecal samples were taken to the laboratory, where they were processed within one to two hours. Three grams of feces were homogenized into 45 ml of a saturated salt solution (BDH, Chemicals Ltd, England). The simple McMaster technique was used to identify and count the oocysts (1). *E. tenella* was identified as the most dominant species. A few *E. necatrix* were also found. Samples were collected for seven weeks posttreatment.

Statistical analysis

Mean weight gains and OPGs of the three treated control groups were analyzed by one-way ANOVA with SPSS software. Mean OPGs were then separated and compared with the Newman-Keuls test (comparison of unplanned means) using the same software.

■ RESULTS

Results of the investigations are shown in Figures 1 and 2. Figure 1 shows that all three drugs effectively controlled coccidia in the environment since OPGs in all treated groups remained almost constant.

There was a significant reduction ($p < 0.05$) by ANOVA in the mean OPGs of the three treated groups compared with the control group. This reduction in OPGs was maintained throughout the length of the experiment, at the end of which (seven weeks) broiler chickens were usually sold. However, comparison of overall mean OPGs of the treated groups with the Newman-Keuls test showed there was a significant difference ($p < 0.05$) in the efficacy (in terms of reduction of OPGs) of Coccid[®] compared with Qiu Jia[®] and of Coccicontrol[®] also compared with Qiu Jia[®].

Figure 2 shows the mean weight gain of chickens in the treated and control groups. A comparison of weight gain between the treated groups using ANOVA showed that there was no significant difference ($p > 0.05$) among the treated groups and between the treated groups and the control group.

■ CONCLUSION

The amprolium compounds and Qiu Jia[®] were effective in reducing the coccidial oocyst excretion in broiler chickens under natural challenge. Qiu Jia[®] was superior to amprolium compounds thereby supporting previous reports (2, 5). It could also be used as a drinking water-based anticoccidial.

The lack of a significant difference in the mean weights of the treated and control groups was possibly due to the light infection (OPG = 2000) in the broilers compared to a clinical infection in nature (OPG \geq 20,000). It results from better management of the dry matter of litter manure in experimental houses (3). This subclinical level of infection did not thus have a bearing on the weight gain. Other treatment trials should be undertaken on farms where clinical coccidiosis is reported.

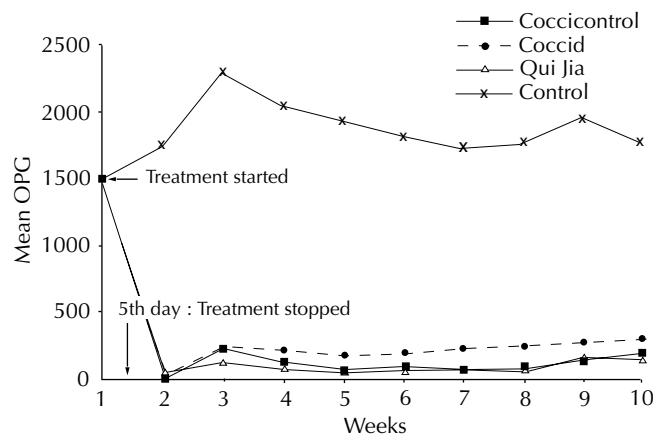


Figure 1: Oocysts per gram of feces (OPG) using three different anticoccidials during the pretreatment, treatment and posttreatment periods.

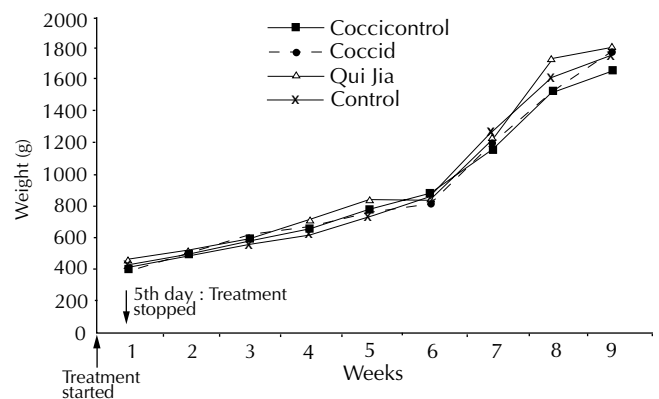


Figure 2: Weights of chickens in the three treated and the control groups.

Acknowledgments

We thank NARO for funding the study. We also extend our appreciation to Messrs G. Kuboi, J. Mubooli and P. Jamugishanga for their technical inputs. This paper is published with the permission of the Director of Livestock Health Research Institute (LIRI), Tororo, Uganda.

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Reçu le 22.01.2001, accepté le 05.10.2001

Résumé

Mukiibi-Muka G., Otim M.O., Musisi G., Illango J., Galiwango T., Olaho-Mukani W. Etude comparative de l'efficacité de l'amprolium et du diclazuril chez des poulets de chair naturellement infectés en Ouganda

L'efficacité de deux médicaments anticoccidiens synthétiques (l'amprolium et le diclazuril) a été étudiée chez des poulets de chair naturellement infectés en Ouganda. Les médicaments ont été administrés par voie orale, mélangés dans de l'eau. L'évaluation du niveau d'infection a été effectuée par la numération des oocystes de coccidies. Les deux médicaments ont été efficaces dans le contrôle de l'excrétion des coccidies, mais l'efficacité du diclazuril a été plus grande. L'administration du diclazuril par voie orale au lieu de l'administration habituelle dans la nourriture a été efficace. Aucune différence de poids n'a été observée entre les groupes traités et le groupe témoin jusqu'à l'âge d'abattage.

Mots-clés : Volaille - Poulet de chair - *Eimeria* - Amprolium - Anticoccidien - Ouganda.

Resumen

Mukiibi-Muka G., Otim M.O., Musisi G., Illango J., Galiwango T., Olaho-Mukani W. Estudio comparativo sobre la eficacia del diclazuril y del amprolium en pollos de engorde infectados en forma natural en Uganda

Se estudio la eficacia de dos drogas sintéticas anti coccidia (amprolium y diclazuril) en pollos de engorde infectados en forma natural en Uganda. Las drogas se administraron en forma oral en el agua de los bebederos. Los conteos de oocistos fueron utilizados para indicar el nivel de infección. Ambas drogas fueron efectivas para el control de la coccidia, aunque el diclazuril fue superior en lo referente a la reducción en la excreción de oocistos. Diclazuril, administrado por vía oral en vez de en el alimento, forma usual, fue efectivo. No hubo diferencias en las ganancias de peso entre los grupos de pollos de engorde tratados y los control hasta la edad del sacrificio.

Palabras clave: Ave de corral - Pollo de engorde - *Eimeria* - Amprolio - Coccidiostatico - Uganda.