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Prophylaxis and treatment of chicken coccidiosis in replacement pullets with toltrazuril

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Abstract

Toltrazuril in drinking water in the concentration of 25 and 50 ppm were given to 2 layer replacement pullet groups for 8 hours each period. To enhance immunity production, toltrazuril using in the prevention programme was given as a single 5 and double 10 days intervals alternately in chickens 10 days of age onward. Group 3 was a non-medicated control. Clinical and sub-clinical of coccidiosis could be observed in week 6 in groups 1 and 3. The infected groups were treated with toltrazuril 25 and 50 ppm in drinking water for 24 and 8 hours respectively. Coccidiosis was not observed on day 5 after treatment. Prevention of coccidiosis in replacement pullets by using toltrazuril in drinking water might be the other alternative.

Keyword(s) : Chicken coccidiosis, replacement pullets, toltrazuril

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Introduction

Coccidiosis in chickens are commonly found all over the world. Prevention programme of the disease in replacement pullets are different from farm to farm. Some particular coccidiostats in feed are used in most of them with incomplete successful outcome. Subclinical or clinical disease can be easily observed in all farms during a particular time of the replacement pullets raising period. Due to the long keeping period on litter or life-long in case of breeder pullets, controlling of the disease by coccidiostats and enhancing the natural or acquired immunity are the appropriate choices.

Toltrazuril* a new synthetic drug, has shown to possess broad spectrum anticoccidial activity to the endogenous stages of coccidia, either schizogony or gamogony (Melhorn et al. 1984). It can be applied by mixing 10 or 8 ppm in feed (Haberkorn, 1985a; and Manop Muangyai et al. 1990) or intermittent treatment in drinking water in the concentration of 25 to 75 ppm (Haberkorn, 1985b; and Gruel and Ruhrmann, 1986). Due to its wide range of action, toltrazuril may be used for prophylaxis and treatment of chicken coccidiosis.

The pupose of the study is to verify the efficacy of toltrazuril in prevention of chicken coccidiosis in the commercial replacement pullets.

Materials and methods

Experiment was performed in a commercial layer farm in Muang District, Chachoensao Province. Shaving wood was provided

* Bay 9142

for bedding on top of the concrete floor. Ten days old chickens were divided into 3 groups : 2,400, 2,400 and 3,200 in three separated pens. Toltrazuril 25 and 50 ppm in drinking water were used in groups 1 and 2 respectively for 8 hours in the prevention programme while group 3 was the non-medicated control. Feed was supplied by hanging system *ad libitum*. In order to break the life cycle of the parasite and to enhance the immunity, the drug was applied at the interval of single 5 and double 10 days alternately in 10 days old chicks onward. Due to the management error, the drug for groups 1 and 2 was sufficient for only 5 hours in week 5 of the prevention scheme.

Weight gain and accumulating mortality were weekly recorded. Lesion scoring had been performed on weeks 3, 4, 5, 6 and 7. The scoring system was performed after Johnson and Reid (1970). The number of sacrificed chicks were $N^{1/3}$ of the total birds in each group (Gard and Tonkinson, 1970).

Subclinical and clinical coccidiosis outbreak were observed on week 6 in groups 1 and 3. Treatment with toltrazuril was immediately applied to chicken in groups 1 and 3, 25 ppm for 24 hours and 50 ppm for 8 hours respectively.

Results

Growth rates of the experiment chickens were not substantially different among the 3 groups. Accumulating mortality of the non-prophylaxis group (group 3) was higher than the other 2 groups (Table 1). In week 6, subclinical and clinical coccidiosis have appeared in group 1 and 3 respectively. *Eimeria tenella* and *E. maxima* were examined from group 1 and *E. tenella*, *E. necatrix*, *E. maxima*, and *E. acervulina* from group 3 (Table 2). Lesion scores of *E. necatrix* of group 3 was significantly

Table 1 : Growth rate and accumulating mortality

Age (week)	Group 1		Group 2		Group 3	
	Weight (gm)	Accumulating mortality	Weight (gm)	Accumulating mortality	Weight (gm)	Accumulating mortality
1	40	1	36	1	35	1
2	45	2	42	5	40	8
3	55	3	50	6	47	14
4	65	5	60	8	60	25
5	110	7	105	9	100	26
6 ^a	170	11 [*]	175	9	165	30 ^{**}
7	250	13	245	9	240	31
8	ND	16	ND	13	ND	36

^a treatment, ^{*} Subclinical coccidiosis, ^{**} Clinical coccidiosis, ND = Not Done

Table 2 : Average score lesions and species of coccidiosis

Age (wks.)	Group	<i>E.tenella</i>	<i>E.necatrix</i>	<i>E.maxima</i>	<i>E.acervulina</i>
3	1	0	0	0	0 (n=14)
	2	0	0	0	0 (n=14)
	3	0	0	0	0 (n=15)
4	1	0	0	0	0
	2	0	0	0	0
	3	0	0	0	0
5	1	0	0	0.07+0.1 ^a	0
	2	0	0	0	0
	3	0	0	0	0
6	1	0.4+0.6 ^a	0 ^a	0.3+0.5 ^b	0 ^a
	2	0.07+0.1 ^a	0 ^a	0.07+0.1 ^a	0 ^a
	3	0.4+0.7 ^a	0.4+0.7 ^b	1.07+1.16 ^b	0.4+0.9 ^a
7	post treatment on day 5				
25ppm for 24hrs	1	0	0	0	0
No treatment	2	0	0	0	0
50ppm for 8hrs	3	0	0	0	0

^{a, b} The common superscript is not significantly different at 1 % level of significant (Duncan' multiple range test)

different from the other groups and *E. maxima* in group 1, 3 were significantly different from group 2 at 1 % level of significance using Duncan's multiple range test analysis.

Discussion

Most of the coccidiostats available now are used by mixing in feed at the definite period for prevention. However, feed restriction or skip a day programme are quite neccessary in all farms particularly in breeder pullets to limit the growth rate of the chickens. Such a process comes to interfere the effectiveness of the drug in disease prophylaxis becuse of less amount of drug will be consumed thus may lead to the outbreak of coccidiosis.

Coccidostats in drinking water is the other alternative measure in prevention of the disease. Toltrazuril is usually very effective in the treatment of coccidiosis in chickens and other animals. Prevention of this disease by toltrazuril has been tested effectively by Haberkorn (1985b) by applied 25 ppm for 2 consecutive days to broilers in 2nd, 3rd and 4th weeks. For the convenient of management, the period of treatment in this study had been decreased to be only 8 hours and the intervals were 5 and 10 days in order to produce flock immunity. Outbreak of the disease that appeared after week 5 might be due to the very short treatment period (5 instead of 8 hrs.) or the accumulation of overwhelming oocysts in the bedding. On week 6 *Eimeria tenella*, *E. necatrix*, *E. maxima* and *E. acervulina* were examined in group 3 but only *E. tenella* and *E. maxima* in group 1 and 2. Kutzer and Leibetseder (1985) reported that toltrazuril had good effect against *E. tenella*, *E. maxima* and *E. acervulina*. In sub-clinical coccidiosis, toltrazuril of 25 ppm for 24 hours gave good

efficacy for the treatment and 50 ppm for 8 hours could be used in a mild outbreak. Muangyai et al, (1987) reported that toltrazuril 25 and 75 ppm in drinking water could destroy *E. tenella* coccidiosis effectively when applied for 24 and 8 hours respectively.

It could be concluded from this study that toltrazuril in drinking water could be applied for prevention of coccidiosis in layer replacement pullets.

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การป้องกันและการรักษาโรคบิดในไก่ ระยะก่อนไข่ด้วยยาโทลทราซูริล

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บทคัดย่อ

การทดลองป้องกันและรักษาโรคบิดในไก่ระยะก่อนไข่ด้วยยาโทลทราซูริล โดยแบ่งไก่ออกเป็น 3 กลุ่ม ในกลุ่มที่ 1 และที่ 2 ให้ยาโทลทราซูริลผสมในน้ำดื่มขนาด 25, 50 ppm ให้ยานานครั้งละ 8 ชม. โดยมีระยะห่างกัน 5 วัน 1 ครั้งและ 10 วัน 2 ครั้งสลับกันไป โดยเริ่มให้ยาครั้งแรกเมื่ออายุ 10 วัน ส่วนกลุ่มที่ 3 เป็นกลุ่มควบคุม การประเมินผลทำโดยดูอัตราการเจริญเติบโต อัตราการตายสะสม และการอ่านค่ารอยโรค ในการให้ยาเมื่อไก่อายุ 5 สัปดาห์นั้น เนื่องจากยาไม่พอจึงได้ให้ยาเพิ่ม 5 ชม. เท่านั้น เมื่อไก่อายุ 6 สัปดาห์เกิดโรคบิดชนิดที่ปรากฏและไม่ปรากฏอาการในไก่กลุ่มที่ 1 และ 3 ได้ทำการรักษาโดยให้ยาโทลทราซูริลในขนาด 25 ppm นาน 24 ชม. ในไก่กลุ่มที่ 1 และขนาด 50 ppm นาน 8 ชม. ในไก่กลุ่มที่ 3 ทำการประเมินโดยการดูรอยโรค 5 วันหลังทำการรักษา ไม่พบรอยโรคแต่ประการใด จึงอาจสรุปได้ว่าสามารถใช้โทลทราซูริลผสมในน้ำดื่มเพื่อป้องกันโรคบิดในไก่ได้

คำสำคัญ : โรคบิด, ไก่ระยะก่อนไข่, โทลทราซูริล

1 หน่วยประสิทธิวิทยา ภาควิชาพยาธิวิทยา คณะสัตวแพทยศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย

2 บริษัท ไบเออร์ไทย จำกัด