

3-1-1990

Efficacy of Toltrazuril and Maduramicin in the Contral of Coccidiosis in Broilers

Manop Muagyai

Surasak Sirichokchatchawan

Virote Juranukul

Follow this and additional works at: <https://digital.car.chula.ac.th/tjvm>



Part of the [Veterinary Medicine Commons](#)

Recommended Citation

Muagyai, Manop; Sirichokchatchawan, Surasak; and Juranukul, Virote (1990) "Efficacy of Toltrazuril and Maduramicin in the Contral of Coccidiosis in Broilers," *The Thai Journal of Veterinary Medicine*: Vol. 20: Iss. 1, Article 2.

DOI: <https://doi.org/10.56808/2985-1130.1538>

Available at: <https://digital.car.chula.ac.th/tjvm/vol20/iss1/2>

This Article is brought to you for free and open access by the Chulalongkorn Journal Online (CUJO) at Chula Digital Collections. It has been accepted for inclusion in The Thai Journal of Veterinary Medicine by an authorized editor of Chula Digital Collections. For more information, please contact ChulaDC@car.chula.ac.th.

Efficacy of Toltrazuril and Maduramicin in the Control of Coccidiosis in Broilers

*Manop Muangyai*¹
*Surasak Sirichokchatchawan*²
*Virote Juranukul*²

Abstract

Toltrazuril, a triazinone anticoccidial drug, was evaluated for efficacy at 8 ppm against Maduramicin 5 ppm in feed under a commercial trial condition with natural coccidial exposure. The experiment was carried out in 6 trials. Trial 1 was a preliminary study with 1,000 chickens testing for Toltrazuril while 4,000 chicks were used to evaluate Toltrazuril and 3,400 for Maduramicin in trial 2 to 6. Necropsy and score lesion reading were performed. Subclinical coccidiosis of *Eimeria acervulina* and *E. maxima* exhibited in Toltrazuril treated group, and *E. acervulian*, *E. maxima* and *E. tenella* in Maduramicin group. Lesion scores were not substantially different. Infection in rainy season appeared to be higher than others. Oocyst per gram of feces was only slightly higher in Maduramicin group than Toltrazuril. The oocysts production reached peak in the 5th week.

Keyword(s) : Toltrazuril, Maduramicin, coccidiosis broilers

¹ Divison of Parasitology, Faculty of Veterinary Science, Chulalongkorn University. Henri-Dunant Road. Bangkok 10330. Thailand.

² Bayer Thai Co. Ltd., Bangkok Thailand.

Introduction

Several kinds of coccidio-
stats both chemicals and poly-
ether ionophores have been used
for the control of coccidiosis
in chickens. Polyether ionop-
hores are now widely used because
of its high efficacy and slow
resistant effect. Maduramicin^{*}
is the latest member of this
group which has come out in the
market (McDougald, 1984). For
chemical substances, Toltrazuril^{**}
has been introduced for treat-
ment of chicken coccidiosis re-
cently (Gruel and Ruhrmann,
1986., Muangyai *et al* 1987 a.).
It has the effects on endo-
genous stages of parasite either
in asexual or sexual form
(Haberkorn and Stotefuss, 1987).
Intermittent metaphylaxis in
drinking water has been tried
in broilers and layer pullets
with promising results (Kutzer
and Leibetseder, 1985., Kutzer
et al 1983., Muangyai *et al*

1987 b.). It is interesting to
try Toltrazuril in feed for the
prevention of coccidiosis in
broilers.

The purpose of this study
is to determine the efficacy of
Toltrazuril 8 ppm in feed for 28
days in comparison to Madura-
micin 5 ppm in feed for broiler
in a commercial farm conditions.

Materials and Methods

Six experiments had been
carried out during 1987-1988 in
a commercial farms, Rayong Pro-
vince. All trials were per-
formed under the commercial farm
conditions. Day-old chicks
which were the own farm product
had been used in the experi-
ments. All vaccination pro-
grams, management and feed were
provided in normal commercial
method.

Parameters of the trials
were lesion scores (Johnson and

* Cygro. American Cyanamide Co. Ltd. USA.

** Baycox. Bayer Co. Ltd. West Germany

Reid, 1970) and oocyst per gram count (Conway, 1979).

Toltrazuril was mixed in feed for 8 ppm and had been used in feed for 28 days, and Maduramicin 5 ppm was used to compare the efficacy. Feed and water were supplied *ad libitum*. In the 1st experiment, 1,000 chicks were tested with only Toltrazuril in feed, while experiment 2 to 6 chickens were divided into 2 groups. The first group, with 4,000 chicks were tested for Toltrazuril and the other 3,400 chicks for Maduramicin. Chicks were then sacrificed according to the program shown in table 1. Statistical analysis was performed by Duncan's Multiple Range Test and $P < 0.05$ was considered as significant.

Results

Results from trial 1 to 6 indicated that species of chicken coccidiosis were *Eimeria acervulina*, *E. maxima*, and *E. tenella*. Only subclinical coccidiosis could be demonstrated in all infection (Table 1). There was no obvious different in species of *Eimeria* and score lesions between two medicated groups and the oocyst per gram in Maduramicin treated group was not different from the Toltrazuril treated group. (table 2). It seems that infection in the rainy season is likely to be higher (trial 3, 4 and 5) than in dry season (trial 1, 2 and 6). The oocyst per gram of feces increased to the peak in the 5th week in both groups.

Table 2 Weekly average oocysts per gram of feces

Weeks	Toltrazuril	Maduramicin
3	2,900	3,100
4	16,166	34,720
5	33,990	54,380
6	19,133	16,280

No significant difference ($P > 0.05$) in oocyst per gram of the two treatments

Table 1 Period of experiments, average lesion=score and oocyst per gram (OPG) of feces in preventive program of Toltrazuril and Maduramicin to coccidiosis

Trials	Periods	Weeks	Average Lesione Score		Oocyst Per Gram	
			Toltrazuril	Maduramicin	Toltrazuril	Maduramicin
1	October 1987	3	0		0	
		4	0		7,800	
		5	E.maxima 0.3	Not done	7,800	Not done
		6	0		800	
		7	0		12,400	
2	March 1988	4	0	0	15,600	4,800
		5	0	E.acervulina 0.73	85,400	170,200
		6	0	0	400	3,600
3	May 1988	4	0	0	0	0
		5	E.acervulina 1.81	E.acervulina 0.87	122,400	8,800
		6	0	E.acervulina 0.73	0	52,000
				E.tenella 0.53		
4	July 1988	4	E.maxima 0.31	E.maxima 0.13	14,400	51,200
			E.acervulina 0.31	E.aervulina 0.53		
		5	E.acervulina 0.13	E.maxima 0.13	6,600	50,000
		6	0	0	3,800	3,400
5	September 1988	3	0	E.acervulina 0.13	2,000	5,600
		4	E.maxima 0.06	E.maxima 0.06	50,400	102,000
				E.acervulina 0.53		
		5	E.maxima 0.06	E.tenella 0.93	13,000	31,200
		6	E.maxima 0.31	0	99,400	1,600
			E.acervulina 0.5			
6	November 1988	3	0	0	3,800	600
		4	E.acervulina 0.06	0	8,800	15,600
		5	0	E.tenella 0.26	4,200	14,200
				E.maxima 0.06		
		6	E.acervulina 0.06	0	10,600	20,800

Sacrificed chicken numbers: Trial 1 Toltrazuril = 10

Trial 2-6: Toltrazuril = 16

Maduramicin = 15

Discussion

Based on the finding of this study, Toltrazuril 8 ppm in feed for 28 day had a comparable effect to 5 ppm of Maduramicin for the control of poultry coccidiosis. Johnson *et al.* (1985) found that 6,9 and 12 ppm of Toltrazuril in feed could produce immunity against oocyst in chickens. Similar result was also obtained when 25 or 50 ppm were given to broilers or layer pullets intermittently in drinking water (Kutzer *et al.*, 1986 and Muangyai *et al.*, 1987 b). Maduramicin had a good effect at the level of 5 ppm in feed for prevention of coccidiosis in broilers as well (Kantor *et al.*, 1984). Infection with *E. tenella* could be prevented with Toltrazuril but not with Maduramicin. However, both drugs exhibited a satisfactory effect in pre-

venting a clinical coccidiosis in broilers. It was obvious that subclinical coccidiosis could be found in rainy season more often than in dry season. This may be due to humidity which plays an important role in sporulation of coccidial oocysts. However, the peak of average oocyst per gram of feces production in this experiment was on the 5th week in both medicated groups, one week later than that reported by Reyna *et al.* (1983). The principle factor may come from the environmental factors

Acknowledgement

We wish to thank Phae Trakul Farm, Mabtaput District, Rayong Province, for the permission to perform this experiment in the farm and Assistant Prof. Dr. Chancharat Reodecha for her assistance in statistical analysis.

References

- Conway, D.P. 1979. Poultry coccidiosis. Diagnostic and testing procedures Pfizer International Inc. p. 37-40.
- Gruel, E. and Ruhrmann, U. 1986. Untersuchungen zur Wirksamkeit unterschiedlich hoher und zeitlich variierter Medikation von Baycox bei experimenteller Huhnkokkizidiose unter Kaefigbedingungen. Deutsch Tieraerztl. Wochschr. 93: 29-33.
- Johnson, J. and Reid, W.M. 1970. Anticoccidial drugs : lesion scoring technique in battery and floor-pen experiments with chickens. Exp. Parasitol. 28:30-36.
- Johnson, C.A., Kenedy, T.J. and Moeller, M.W. 1985. Immunization of chickens against coccidiosis by termination of infections with BAY VI 9142. Abstract from the : Georgia coccidiosis conference. An International Symposium On Avian Coccidiosis. November 18-20:1985.
- Kantor, S., Schenkel, R.H. and Kennett, Jr. R.L. 1984. CL 259, 971 : A potent new anticoccidial. 2. Floor pen trials. Poultry Science 63: 1506-1511.
- Kutzer, E. and Leibetseder, J. 1985. Untersuchungen ueber die Wirkung eines neuen Antikokzidiums (BAY Vi 9142) bei Broilern. 1. Mitteilung. Wein. Tieraerztl. Mschr. 72:321-330.
- Kutzer, E., Freiler, I. and Mitterlehner, A. 1985. Untersuchungen ueber die Wirkung eines neuen Antikokzidiums (BAY Vi 9142) bei Broilern. 2. Mitteilung. Wein. Tieraerztl. Mschr. 72:330-334.
- McDougald, L.M. 1984. Coccidiosis and its control. American Cyanamide Company. p. 49.
- Muangyai, M., Sirichokchatchawan, S. and Juranukul, V. 1987. a Prophylaxis and treatment of chicken coccidiosis in replacement pullets with toltrazuril. Abstracts. The 14th annual veterinary sciences conferences. The Thai Veterinary Medical Association under Royal Patronage. 27-29 November, 1987.
- Muangyai, M. Trakarnrungsie, N. and Buranathai, C. 1987 b. Prophylaxis-treatment of caecal coccidiosis in chickens with toltrazuril. Abstracts. The 14th annual veterinary sciences conferences. The Thai Veterinary Medical Association under Royal Patronage. 27-29 November, 1987.
- Reyna, P.S., McDougald, L.R. and Mathis, G.F. 1983. Survival of coccidia in poultry litter and reservoirs of infection. Avian Dis. 17:446-473.

การป้องกันโรคบิดในไก่เนื้อ โดยใช้โทลทราซูริล และมาดูรามัยซิน

มานพ ม่วงใหญ่¹
สุรศักดิ์ ศิริโชคขวาล²
วิโรจน์ จูรานุกุล²

บทคัดย่อ

การประเมินผลการทดลองในการป้องกันโรคบิดในไก่เนื้อโดยใช้ยาโทลทราซูริลและมาดูรามัยซินผสมอาหารในขนาดความเข้มข้น 8 และ 5 ส่วนในอาหาร 1 ล้านส่วน ตามลำดับ โดยได้ทำการทดลองทั้งสิ้นจำนวน 6 ครั้ง ในการเลี้ยงไก่เนื้อซึ่งเป็นแบบการเลี้ยงเพื่อการค้าโดยทั่วไป และการติดโรคบิดเป็นไปตามธรรมชาติ ในการทดลองครั้งแรกนั้นใช้ไก่ 1,000 ตัวโดยใช้โทลทราซูริลเพียงอย่างเดียว สำหรับการทดลองครั้งที่เหลือใช้ไก่ 4,000 ตัวสำหรับการป้องกันด้วยโทลทราซูริล และ 3,400 ตัวสำหรับมาดูรามัยซิน ทำการผ่าซากเพื่ออ่านรอยโรคโดยระบบการให้คะแนน (Lesion score reading) และทำการเก็บอุจจาระเพื่อนำไปนับค่าจำนวนโอโอซิสต์ในอุจจาระ 1 กรัม (Oocyst per gram) ในกลุ่มของไก่ที่ให้โทลทราซูริลผสมในอาหารพบโรคบิดชนิดแฝงของเชื้อบิดชนิด อัยเมอเรียวอะเชอูนาลินา และ อี.แม็กซิมา สำหรับการป้องกันด้วยมาดูรามัยซินพบโรคชนิดแฝงของเชื้อบิดชนิด อี.อะเชอูนาลินา อี.แม็กซิมา และ อี.เทเนลลา ค่าของรอยโรคมีเพียงเล็กน้อยและไม่มี ความแตกต่างกันอย่างมีนัยสำคัญ สำหรับค่าของจำนวนโอโอซิสต์ในอุจจาระ 1 กรัม นั้นในกลุ่มของการป้องกันด้วยมาดูรามัยซิน มีจำนวนสูงกว่ากลุ่มที่ป้องกันด้วยโทลทราซูริลเพียงเล็กน้อย และจำนวนเฉลี่ยของโอโอซิสต์ที่ปล่อยออกมาจะสูงที่สุดในสัปดาห์ที่ 5

คำสำคัญ : โทลทราซูริล, มาดูรามัยซิน, โรคบิด, ไก่เนื้อ

¹ หน่วยวิชาปรสิตวิทยา ภาควิชาพยาธิวิทยา คณะสัตวแพทยศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย

² บริษัท ไบเออร์ไทย จำกัด