

Evaluation of tiamulin and chlortetracycline in feed in the control of CRD in broilers

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Introduction

Mycoplasma gallisepticum (MG) the cause of chronic respiratory disease (CRD) in chickens is still very common in China. CRD is frequently complicated with secondary Escherichia coli infections to cause complicated CRD (CCRD), which has a major adverse effect on growth rate, feed conversion efficiency (FCE) and mortality rate in broilers.

Tiamulin has been shown to be very effective in controlling mycoplasma infections in broilers but due to the widespread use of incompatible ionophore anticoccidials such as salinomycin and monensin, it has made it impossible to use tiamulin because of the risk of interaction between the two product groups.

Burch and others (1993) showed that tiamulin and the tetracyclines had a synergistic activity against MG and that low levels of tiamulin given in feed at 30ppm did not cause any signs of interaction with salinomycin, monensin and narasin (Burch and Stipkovits, 1991, Stipkovits and others, 1992; Stipkovits and others, 1999). Further trial work showed in artificial infection studies that combinations of tiamulin and chlortetracycline in feed (Burch and Stipkovits, 1994; Burch and Stipkovits, 1996) reduced air sac lesions and mortality from CRD and improved the performance of the birds substantially without inducing any signs of interaction with salinomycin in the feed.

It was the purpose of this study to test the efficacy of a combination of tiamulin and chlortetracycline, given for different durations, in the presence of salinomycin and monensin, for the prevention of a naturally occurring CRD and CCRD infection.

Materials and Method

A combination of tiamulin (T) (Tiamutin 10% Premix – Novartis AH) at 30ppm and chlortetracycline (CTC) at 100ppm in feed was tested in a floor pen trial with 250 naturally infected birds/group given T+CTC between days 1-14, 21-34, 1-40 or not at all (untreated control) or tylosin 44 ppm between days 1-40 as a positive control. There were two subsets given the anticoccidials monensin at 90ppm continuously or salinomycin at 60ppm. The trial was terminated on day 49. The cause of mortality was determined by necropsy and bacterial and mycoplasmal cultural examination.

Results

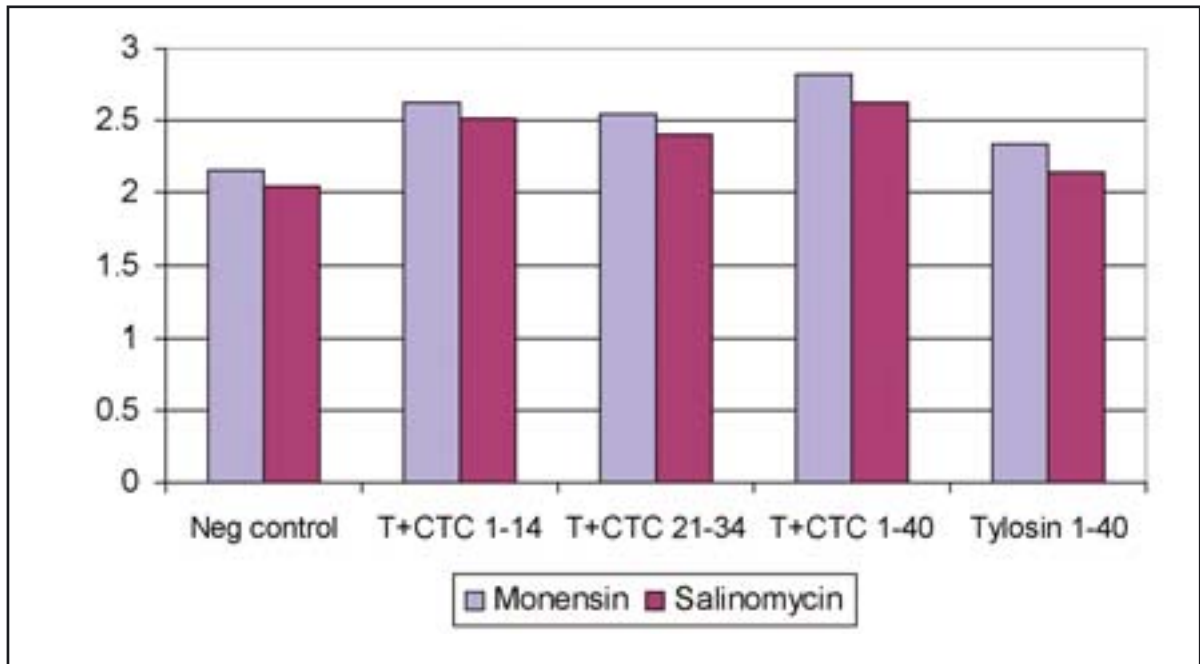
The overall results are summarised in table 1.

Table 1. Trial results summary

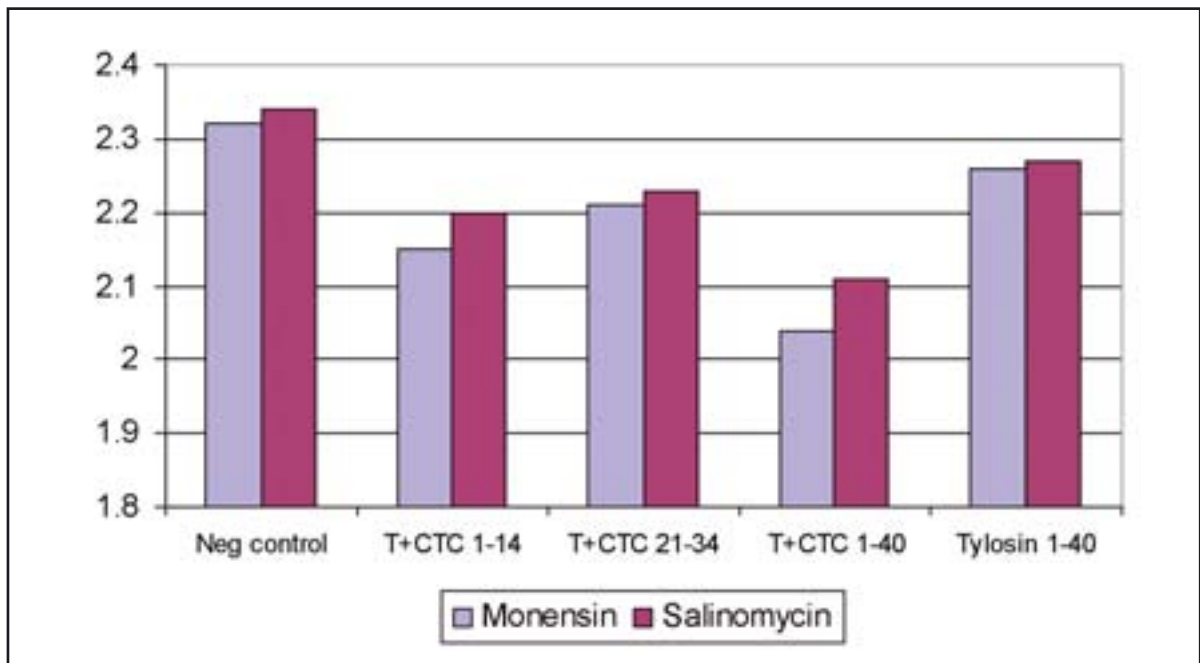
Treatment group	Anticoccidial	Bodyweight (kg) day 49 Improve (%)	FCE Improve (%)	Overall mortality (%)	Mortality due to CRD (%)
Untreated control	Monensin	2.16 (-)	2.32 (-)	20.4	15.2
T30+CTC100 day 1-14	Monensin	2.63 (22)	2.15 (7)	9.8	4.4
T30+CTC100 day 21-34	Monensin	2.55 (18)	2.21 (5)	8.0	3.2
T30+CTC100 day 1-40	Monensin	2.82 (31)	2.04 (12)	4.8	1.2
Tylosin 44 day 1-40	Monensin	2.33 (8)	2.26 (3)	13.0	7.6
Untreated control	Salinomycin	2.04 (-)	2.34 (-)	22.8	16.8
T30+CTC100 day 1-14	Salinomycin	2.52 (24)	2.20 (6)	9.2	4.0
T30+CTC100 day 21-34	Salinomycin	2.41 (18)	2.23 (5)	8.8	3.6
T30+CTC100 day 1-40	Salinomycin	2.63 (29)	2.11 (10)	5.6	1.6
Tylosin 44 day 1-40	Salinomycin	2.14 (5)	2.27 (3)	14.0	8.0

Improvements in bodyweight gain and FCE were seen in all of the treatment groups in comparison with the untreated controls. T+CTC for days 1-14, 21-34 and 1-40 were better than tylosin 40ppm given for days 1-40 and T+CTC for days 1-40 gave overall the best performance results with 30% improvement in bodyweight and 11% improvement in FCE. Interestingly all of the monensin groups gave better performance results than their equivalent salinomycin groups. (See Graphs 1 and 2)

Graph 1. Bodyweight day 49 (kg)

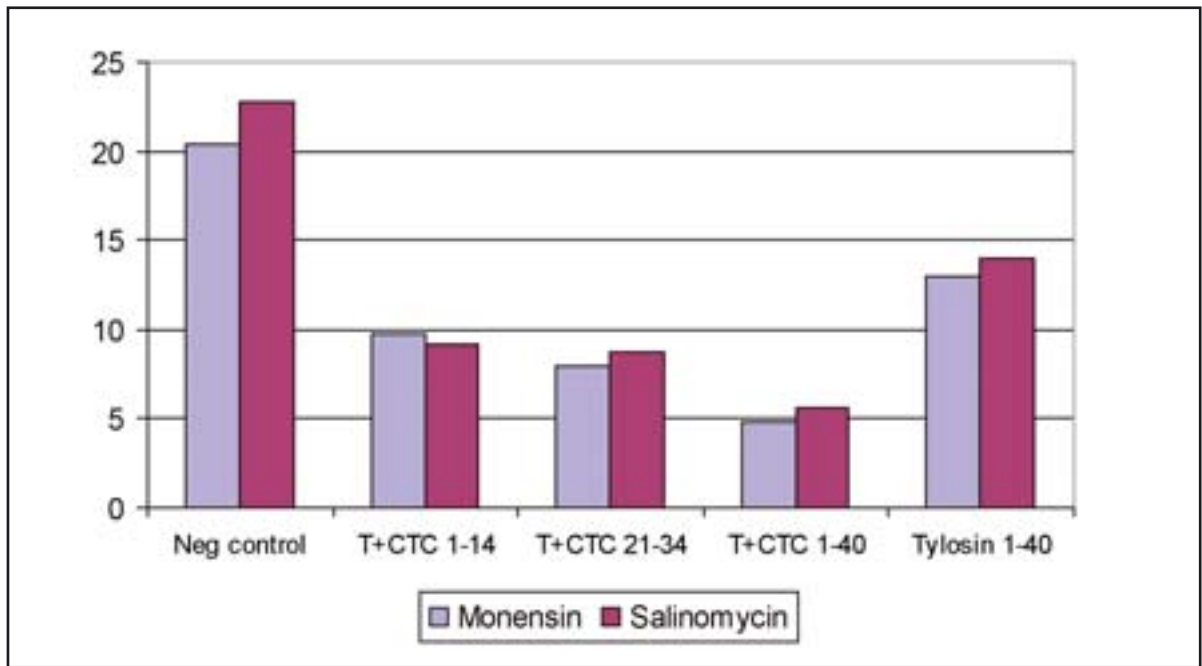


Graph 2. FCE results day 0-49

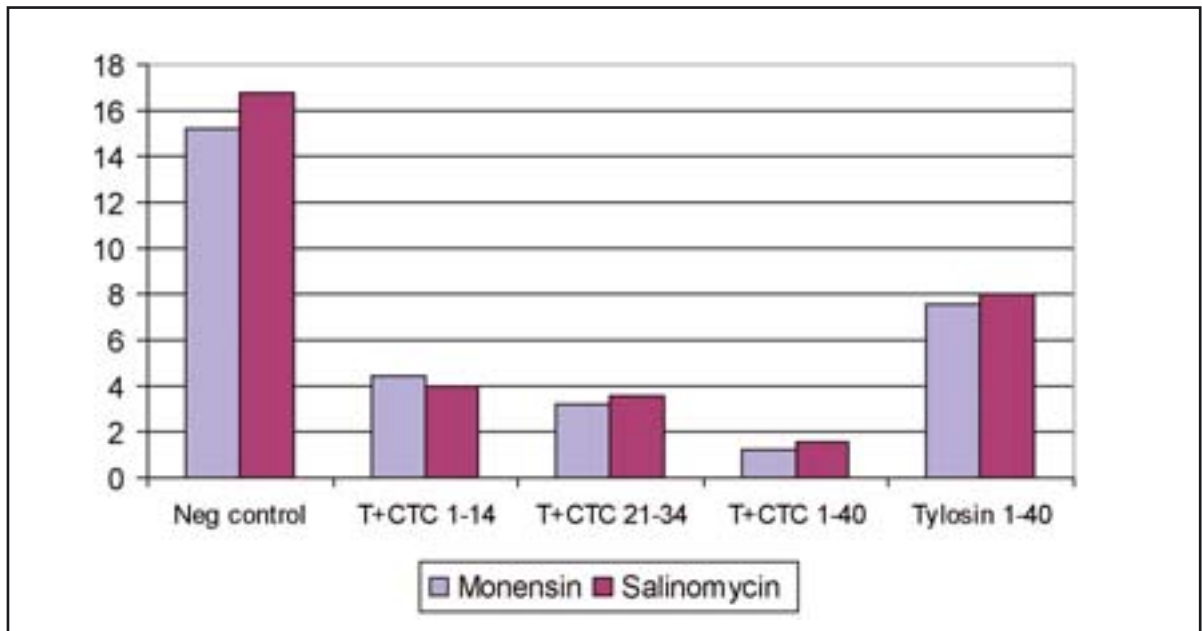


Overall mortality and mortality due to CCRD was lower in the T+CTC groups in comparison with the tylosin and the untreated controls. T+CTC given for days 1-40 had the lowest overall mortality results down from an average of 21.6% in the untreated controls to 5.2%. When mortality due to CCRD is considered it fell from an average of 16% in the untreated controls to 1.4%, a substantial 91% reduction. (See Graph 3 and 4.) Medication with T+CTC in the days 21-34 gave a slightly better reduction in CCRD mortality than T+CTC between days 1-14 down from 4.2 to 3.4% but again much improved over the untreated controls and also the tylosin group which was on average 7.8%.

Graph 3. Overall mortality (all causes) (%)



Graph 4. Mortality due to CCRD (%)



Necropsies of the dead birds showed a severe airsacculitis with cloudiness and cheesy exudation. In severely affected birds there was pericarditis and perihepatitis. *E. coli* and mycoplasma were frequently isolated especially from the untreated birds but markedly less from the T+CTC birds treated for 1-40 days. The T+CTC 1-40 day groups gave the best overall economic return, resulting in a 7 times return on investment.

Conclusions and Discussion

There was no adverse interaction between tiamulin at 30ppm and the ionophores confirming previous work (Burch and Stipkovits, 1991). All of the groups treated with T+CTC gave better results than the untreated control and the tylosin 40ppm positive control. There were minor differences between the T+CTC groups given either days 1-14 or days 21-34, the performance data was slightly better for the earlier treatment but the mortality figures were slightly worse. The T+CTC given for days 1-40 gave the best overall results for performance and mortality and particularly for the reduced mortality due to CCRD, demonstrating an excellent preventive effect in the face of a severe field challenge.

Further information on the Tiamutin® (tiamulin) range of products is available from the Poultry Products Manager at Novartis Animal Health operations in over 50 countries worldwide.

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