

THE ROLE OF PENICILLIN G POTASSIUM IN MANAGING *CLOSTRIDIUM PERFRINGENS* IN BROILER CHICKENS

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Study Results

The efficacy of penicillin G potassium (Pot-Pen) administered via the drinking water to manage necrotic enteritis (NE) was investigated in a *Clostridium perfringens* (CP) challenge study. Results of this study suggest that CP-associated subclinical disease can significantly reduce broiler performance. Furthermore, the positive effects of treatment with Pot-Pen appeared to be associated with the prevention and/or treatment of NE specific lesions (Tables 1 and 2).

Significance of Study Results

As CP is a ubiquitous organism in broiler flocks, results of this study suggest that targeted treatment with aqueous Pot-Pen during the period of greatest susceptibility to NE offers a means of managing NE-associated mortality and subclinical disease. The ability to administer penicillin via the drinking water can result in increased drug intake in birds off-feed and provides flexibility in administration compared to in-feed administration of antimicrobials. In addition, penicillin is a relatively low cost treatment option.

Additional Information

Necrotic enteritis (NE) is a disease of great economic significance to the broiler industry, causing insidious morbidity that interferes with growth and feed efficiency, and there is substantial mortality associated with the more fulminate form of the disease. The spectrum of disease associated with CP includes subclinical infection that affects performance, mild clinical infection characterized by diarrhea, hepatitis that affects performance, and results in condemnation of livers at slaughter, and sudden death with no premonitory signs.

Use of most antimicrobial growth promoters is associated with a dramatic decrease in the incidence of NE. It is believed that CP-

Table 1. Treatment groups in a study to determine the effects of penicillin G potassium (Pot-Pen) administered in the drinking water to chicks inoculated with CP.

Treatment group	Challenged with CP	Pot-Pen dosage (g/L)	Penicillin activity (IU/L)
Negative control	No	0	0
Positive control	Yes	0	0
Pot-Pen 0.2 g/L	Yes	0.2	297,000
Pot-Pen 0.4 g/L	Yes	0.4	594,000

associated clinical and subclinical infection will become an increasing problem among broiler chickens in the European Union as result of the ban of antimicrobial growth promoters. Evidence from Europe to date suggests that not only NE mortality but also subclinical NE is having severe economic consequences for the poultry industry. New control and prevention strategies for CP-associated manifestations are urgently needed because of the increasing restrictions being placed on the use of antimicrobial growth promoters.

New control and prevention strategies for CP-associated manifestations are urgently needed because of the increasing restrictions being placed on the use of antimicrobial growth promoters. Little current published information exists on the efficacy of penicillin in the control of NE. This CP challenge study was undertaken to investigate the utility of penicillin G potassium (Pot-Pen Water Soluble Powder; Vetoquinol, N.-A. Inc, Lavaltrie, Québec, Canada) administered via the drinking water for the management of clinical and subclinical CP infection in broilers under current conditions of poultry husbandry. At the time of writing, treatment of NE with penicillin G potassium constituted extra-label use of the product. However, both the 0.2 and 0.4 g/L dosages of Pot-Pen were clearly and equally effective in preventing NE-associated mortality and subclinical disease.

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Table 2. Pen-level mortality in broiler chicks inoculated with CP and treated with penicillin G potassium (Pot-Pen).^A

Treatment group	Mean mortality (%)				
	Day 17 (start of Pot-Pen administration)–28 (end of study)				Day 20–28 NE only
	No. pens (birds)	All causes ^B	Non-NE ^C	NE only ^D	
Negative control	8 (389)	2.62 ^a	2.05 ^a	0.5 ^a	0.0
Positive control	8 (393)	10.12 ^b	1.26 ^a	8.86 ^b	7.0
Pot-Pen 0.2 g/L	8 (389)	0.76 ^a	0.51 ^a	0.25 ^a	0.0
Pot-Pen 0.4 g/L	8 (396)	2.0 ^a	2.04 ^a	0.00 ^a	0.0

^A Values with different lowercase superscript within a column are significantly different, P -value < 0.05.

^B Test for overall significance of treatment group, P -value = 0.0263.

^C Test for overall significance of treatment group, P -value = 0.2656.

^D Test for overall significance of treatment group, P -value < 0.0001.