



Enradin® vs. Avilamycin and Bacitracin: Efficacy (MIC) against *C. perfringens* and Floor-Reared Broiler Performance

Two recent studies have examined the efficacy and field performance of three growth promotant antibiotics: Enradin® (enramycin), avilamycin and bacitracin methylene disalicylate. The first study, conducted in Japan, examined the sensitivity of *Clostridial perfringens* isolates to the three antibiotics. The second study was a controlled floor-pen trial conducted in Brazil and examined weight gain and feed efficiency in broiler chickens.

Study 1 Design

Enradin® Antimicrobial Feed Additive Efficacy against *C. perfringens*

Antibiotic sensitivity studies were routinely conducted on *C. perfringens* isolated by the Kyodoken laboratory in Japan. Minimum inhibitory concentrations (MICs) were determined for broiler isolates obtained by diagnostic laboratories from 1986 through 2000. Forty-six isolates were tested in 1986, 183 in 1990, 120 in 1995, 46 in 1999 and 173 in 2000. The evolution of MICs for

the isolates from each year are summarized in Figures 1 through 3 on the following pages.

Results and Discussions

C. perfringens demonstrated increasing sensitivity to Enradin over the period from 1986 to 2000, but decreasing or unchanged sensitivity to the other antibiotics. *C. perfringens* MICs for Enradin were consistently lower than were the MICs for the other two antibiotics throughout the time period.

Study 2 Design

Comparative Performance of Broilers Fed Enradin and other Antibiotic Growth Promoters¹

In this study, 1,200 day-old broiler chicks were housed in a concrete floor house with rice hull litter. The house was divided into 24 pens with 50 chicks per pen. Six randomized pens were assigned to each of 4 treatment groups with 300 chicks per group.

Key Points

- MIC testing from 1986 to 2000 shows that the sensitivity of *C. perfringens* to Enradin® Antimicrobial Feed Additive was excellent and improving.
- During the same time, MICs for avilamycin increased, indicating increased resistance of *C. perfringens* to this antibiotic. The response to bacitracin did not change.
- Broilers fed Enradin demonstrated significantly superior feed conversion to bacitracin at 21 and 42 days of age.
- Weights were numerically better for broilers fed Enradin than for those fed avilamycin or bacitracin at 21 and 42 days of age.

Figure 1. *C. perfringens* Sensitivity to Enradin® (enramycin)

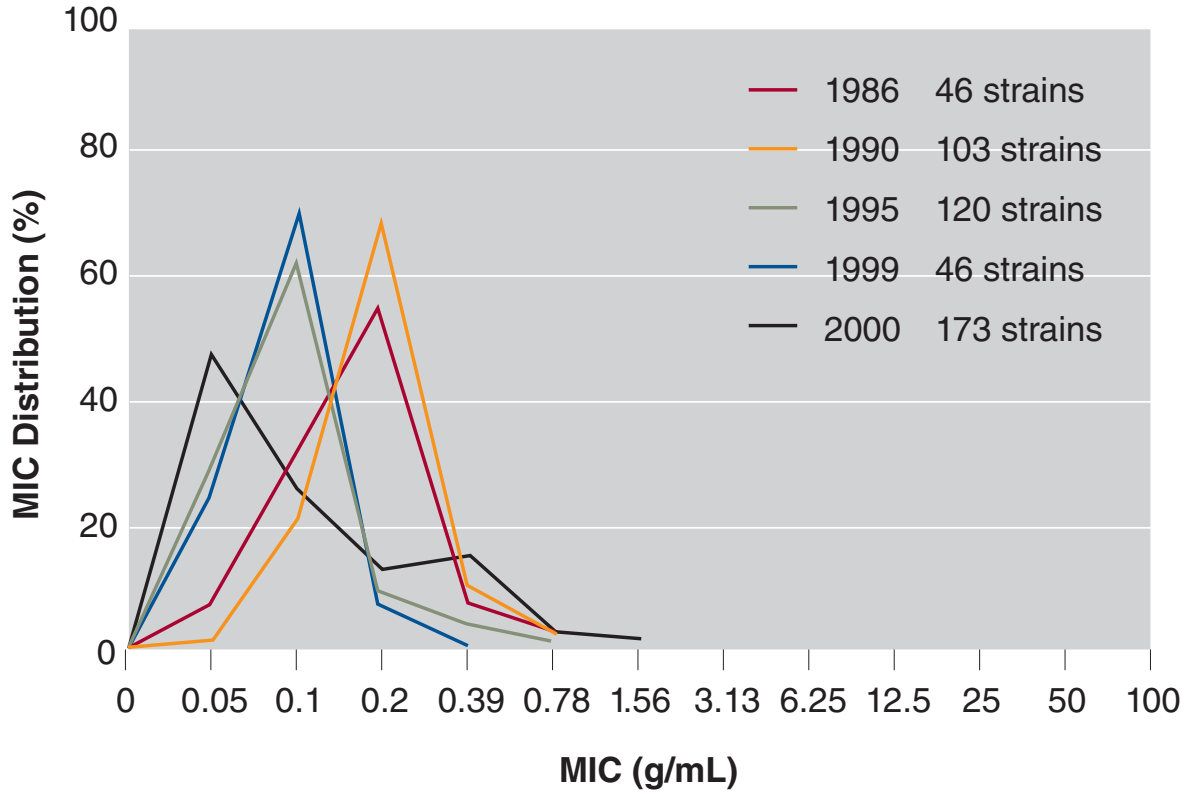


Figure 2. *C. perfringens* Sensitivity to Avilamycin

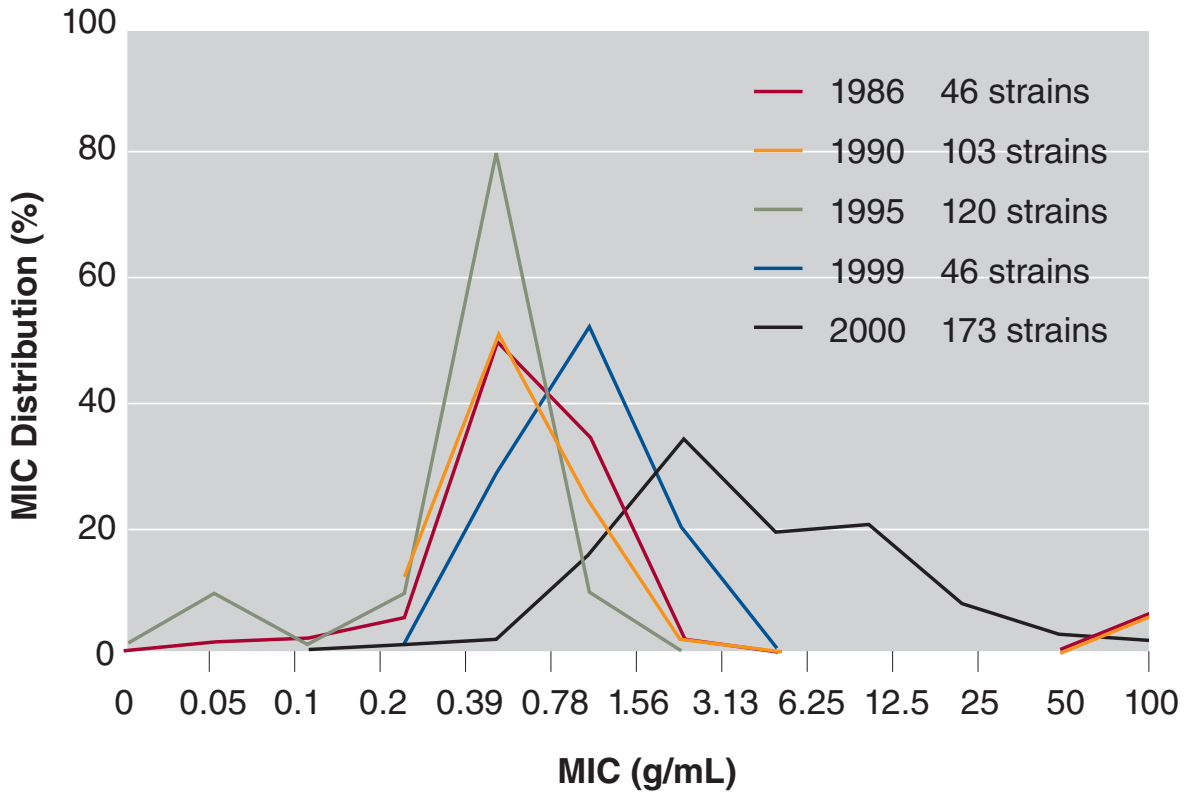


Figure 3. *C. perfringens* Sensitivity to Bacitracin

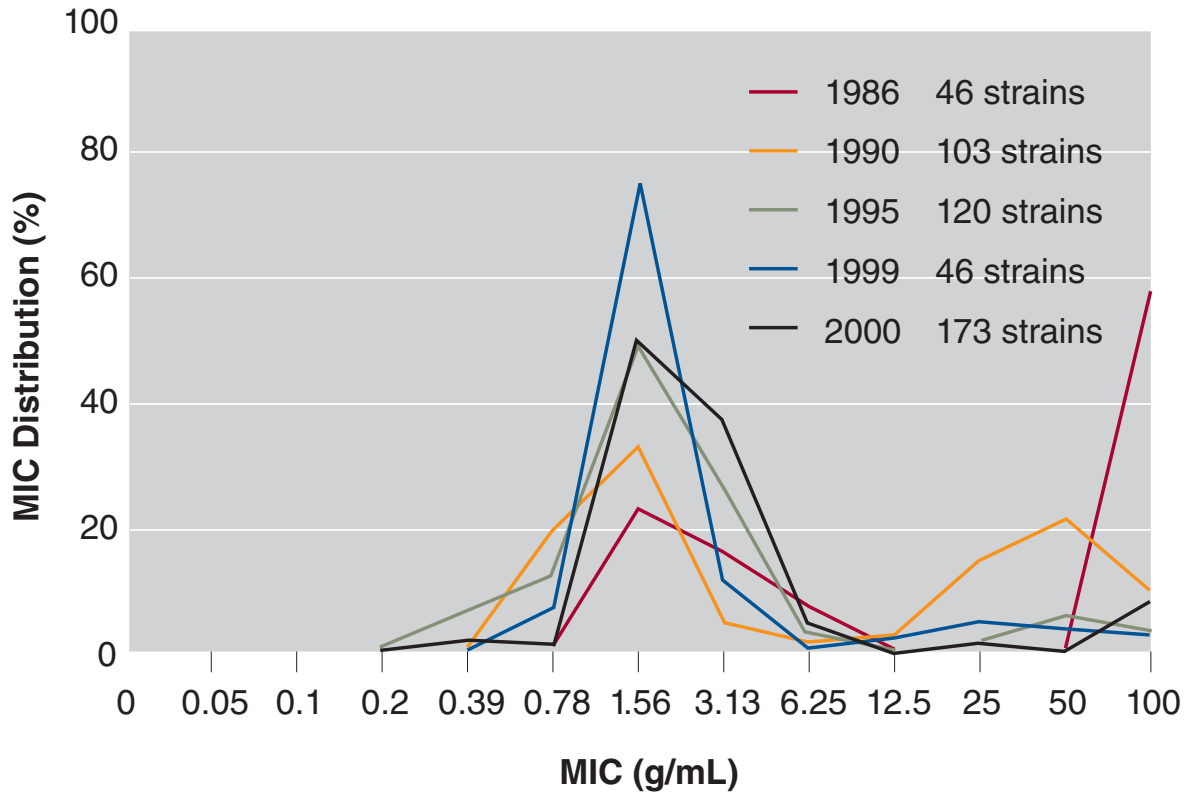


Table 1. Performance of Broilers Raised on Floor and Fed with Antibiotic Growth Promoters

1 to 21 Days of Age	Control	Bacitracin	Enramycin	Avilamycin	CV (%)
Weight Gain (g)	848 ^{ab}	839 ^{ab}	876 ^a	834 ^b	2.85 P<0.05
Feed Consumption (g)	1146	1128	1148	1113	2.29 ns
FCR	1.345 ^a	1.350 ^a	1.311 ^b	1.334 ^{ab}	1.53 P<0.03
Viability (%)	98	98	98	98	1.71 ns
1 to 42 Days of Age					
Weight Gain (g)	2539 ^b	2558 ^{ab}	2617 ^a	2614 ^a	1.63 P<0.02
Feed Consumption (g)	4438	4494	4469	4456	1.46 ns
FCR	1.748 ^a	1.756 ^a	1.707 ^b	1.704 ^b	1.40 P<0.01
Viability (%)	97	97	97	97	1.78 ns

^{a,b} Numbers have statistically significant differences.

Treatments

T1: Control, no antibiotic growth promoter in feed

T2: Bacitracin methylene disalicylate, 27.5 mg/kg

T3: Enradin® (enramycin), 12.5 mg/kg

T4: Avilamycin, 10 mg/kg

Weight gain, feed consumption and livability were measured weekly and at the end of the experiment at 42 days. Feed conversions were calculated at 21 and 42 days of age.

Results and Discussions

Broiler chicks fed Enradin demonstrated significantly better feed conversion and numerically better weight gain than bacitracin methylene disalicylate at both 21 and 42 days of age. Broilers fed Enradin demonstrated numerically better weights and similar feed conversions when compared to avilamycin at both 21 and 28 days. Results are summarized in Table 1 on the preceding page.

Summary

In Japanese MIC studies, *C. perfringens* demonstrated increasing sensitivity to Enradin but decreasing or unchanged sensitivity to two other antibiotics. In addition, field trials from Brazil demonstrated superior performance in flocks receiving Enradin compared to avilamycin or bacitracin methylene disalicylate. Worldwide, Enradin has proved to be a highly efficacious growth promotant antibiotic.

Reference

¹ Pedroso AA. Performance and organ morphology of broilers fed probiotic or antibiotic and raised in batteries or floor pens. PhD dissertation. Universidade do Estado de São Paulo, Brazil. May, 2003.

[Innovative Solutions in Poultry Health]

