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Minimum Inhibitory Concentration Determinations for Ceftiofur Against Swine Pathogens from United States and Canada in 2001-2002

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Introduction and Objectives

Bacterial pathogens commonly isolated from swine respiratory and systemic disease include *Actinobacillus pleuropneumoniae*, *Pasteurella multocida*, *Streptococcus suis*, and *Haemophilus parasuis*. Ceftiofur is a late-generation cephalosporin antimicrobial agent with high potency against these swine pathogens. Since 1997, Pfizer Animal Health (formerly Pharmacia Animal Health) has been conducting an ongoing multi-center program in North America to evaluate susceptibility trends of target pathogens against ceftiofur. The results for the period 1997-2000 have already been published (1). This paper provides updated data for the period 2001-2002.

Materials and Methods

The 2001 and 2002 susceptibility monitoring programs received isolates from twenty-one and sixteen diagnostic laboratories, respectively, in the US and Canada. Isolates were identified by the referring diagnostic laboratory and forwarded to the Pfizer Animal Health Development Research Laboratory for minimal inhibitory concentration (MIC) determinations. MICs were determined using a commercially available broth microdilution system that conforms to the guidelines of the National Committee for Clinical Laboratory Standards (NCCLS) (2).

Results and Discussion

As for previous years, ceftiofur was shown to be highly active against the swine pathogens tested (Table 1).

Table 1. MIC results for ceftiofur

Pathogen	Years Tested	MIC ₉₀ * (ug/mL)	MIC Range (ug/mL)
<i>A. pleuro-pneumoniae</i> (n=89)	2000-2001	<=0.03	<=0.03-0.06
<i>A. pleuro-pneumoniae</i> (n=132)	2001-2002	<=0.03	<=0.03-0.12
<i>P. multocida</i> (n=185)	2000-2001	<=0.03	<=0.03-0.12
<i>P. multocida</i> (n=168)	2001-2002	<=0.03	<=0.03-0.12
<i>S. suis</i> (n=167)	2000-2001	0.06	<=0.03-4.0
<i>S. suis</i> (n=183)	2001-2002	0.06	<=0.03-0.25

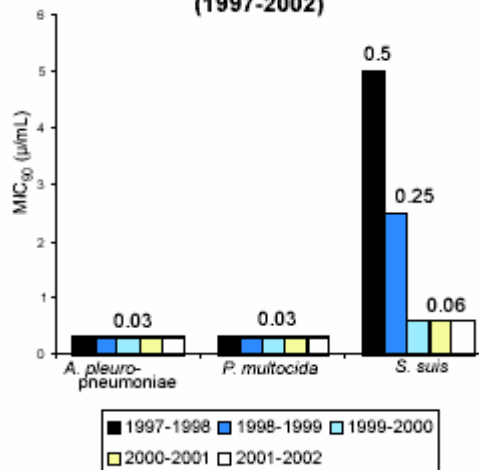
*MIC for 90% of the isolates

All *A. pleuropneumoniae* and *P. multocida* isolates tested were classified as 'susceptible' using the NCCLS approved breakpoint criteria (susceptible', <=2.0 ug/mL.; 'intermediate', 4 ug/mL.; 'resistant', >=8 ug/mL.)

For *S. suis*, 99.7% of isolates tested were classified as 'susceptible' (349/350), and one strain as 'intermediate'. MIC₉₀ values for ceftiofur against *A. leuropneumoniae* and *P. multocida* were <=0.03 ug/mL for both 2001 and 2002. MIC₉₀ values against *S. suis* were 0.06 ug/mL for both years.

These data supplement the preceding 1997-2000 data as shown in Figure 1.

Figure 1. Comparison of MIC₉₀ data for swine target pathogens over five years of monitoring (1997-2002)



Conclusions

Over 12 years of use, swine target pathogens have remained highly susceptible to ceftiofur with no resistance detected. When comparing the ceftiofur MIC results for the entire five years of susceptibility monitoring, the MIC₉₀ values have remained the same or, in the case of *S. suis*, decreased.

References

1. Salmon SA, et al. 2002. Proc.17th IPVS Congress. p.78.
2. NCCLS document M31-A2. NCCLS, 940 West Valley Road, Wayne, PA, USA: 2002.