Minimum Inhibitory Concentration Determinations for Ceftiofur and Spectinomycin against *Pasteurella multocida*, *Mannheimia* spp. and *Haemophilus somnus* from France, The Netherlands, and Germany

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Introduction

Ceftiofur is an extended-spectrum cephalosporin approved in many countries worldwide for treatment of bovine respiratory disease (BRD), as well as respiratory disease of other animals. Ceftiofur has demonstrated excellent *in vitro* activity against bacteria of importance in BRD: *Mannheimia* spp., *Pasteurella multocida*, and *Haemophilus somnus*. Spectinomycin is an aminocyclitol antimicrobial agent. Spectinomycin sulfate was recently approved in the United States for treatment of BRD caused by *P. multocida*, *Mannheimia* spp., and *H. somnus*; approvals are currently pending in other countries. To determine the *in vitro* activity of ceftiofur and spectinomycin against recent BRD pathogens from France, The Netherlands and Germany, minimum inhibitory concentrations (MIC) were determined.

Materials and Methods

The 459 strains tested included: 45 *P. multocida*, 88 *Mannheimia* spp. and 24 *H. somnus* from France and The Netherlands; and 154 *P. multocida* and 148 *Mannheimia* spp. from Germany. MICs were determined using a commercially prepared, dehydrated broth microdilution method that conforms to the recommended guidelines of National Committee for Clinical Laboratory Standards (NCCLS, 1999).[1]

Results

Ceftiofur exhibited excellent activity against the 459 strains with all MIC values #0.12 µg/ml, and 451 of 459 strains (98.3%) yielding MICs #0.03 µg/ml, the lowest dilution tested. Against the strains from France and The Netherlands, spectinomycin yielded MIC #32.0 µg/ml, while all but two strains of *P. multocida* and ten *Mannheimia* spp. from Germany yielded MIC values #32.0 µg/ml.

Conclusions

All strains tested were highly susceptible to ceftiofur. These data are similar to data obtained with BRD pathogens from the United States.[2] Additionally, these data show that since its first approval in 1988, ceftiofur remains highly active against all BRD pathogens. Also, all strains from France and The Netherlands, and > 95% from Germany, were susceptible to spectinomycin.

References

1. National Committee for Clinical Laboratory Standards. Document M31-A. Wayne, PA. 1999.
2. Watts JL, Yancey Jr RJ, Salmon SA, Case CA: *J Clin Microbiol* 32:725-731, 1994.

Table 1. Summary of minimum inhibitory concentration values for ceftiofur and spectinomycin against bovine respiratory disease pathogens from all countries.

	Minimum inhibitory concentration (µg/ml)		
Organism (no. tested)	MIC_{50}	MIC_{90}	Range
Pasteurella multocida (199)			
Ceftiofur	= 0.03	= 0.03	=0.03-0.12
Spectinomycin	16.0	32.0	4.0->512.0
Mannheimia spp. (236)			
Ceftiofur	= 0.03	= 0.03	=0.03-0.12
Spectinomycin	16.0	32.0	4.0-32.0
Haemophilus somnus (24)			
Ceftiofur	= 0.03	= 0.03	= 0.03
Spectinomycin	16.0	32.0	8.0-32.0