

Antibiotic susceptibility in *Pasteurella multocida* and *Streptococcus suis* isolated at the Minnesota Veterinary Diagnostic Laboratory (2006-2016)

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Key Points:

- MVDL data was analyzed to study antibiotic susceptibility in clinical isolates of *Pasteurella multocida* and *Streptococcus suis* from 2006-2016
- Isolates were highly susceptible to Ampicillin, Ceftiofur, Enrofloxacin and Florfenicol throughout the study period
- There were no changes in antibiotic susceptibility against the antibiotics tested routinely across the study period

Pasteurella multocida and *Streptococcus suis* are potentially pathogenic bacteria that can cause severe morbidity and mortality in swine. Antibiotics are the mainstay for treatment of pigs clinically infected with these bacteria. However, unlike with the major enteric pathogens, the patterns and trends of antibiotic susceptibility of these bacteria are rarely reported. The objective of this study was to assess the antibiotic resistance patterns over a long time period (2006-2016) in the aforementioned pathogen isolated from swine clinical samples, at the MN-Veterinary Diagnostic Laboratory (MVDL).

Methods- Between January 2006 and December 2016 8,671 *Pasteurella multocida* and 7,040 *Streptococcus suis* isolates were cultured from swine clinical samples using routine culture methods, and further screened for resistance against a panel of antibiotics using the Sensititre automated microdilution method. Minimum Inhibitory Concentrations (MIC) for Ampicillin (A), Ceftiofur (C), Enrofloxacin (E), Oxytetracycline (O) and Florfenicol (F) were obtained and isolates were classified as either susceptible or non-susceptible (resistant or intermediate) according to cutoff values provided by the Clinical & Laboratory Standards Institute (CLSI) (1).

Results- The percentage of isolates of both *P. multocida* and *S. suis* susceptible to A, E, C and F ranged between 90 and 99. In contrast, the percentage of *P. multocida* isolates susceptible to O ranged between 58.1 and 71.6 throughout the study period, while only 2.9 percent of *Streptococcus suis* isolates were susceptible to O. For both pathogens, percentage of isolates susceptible to all five antibiotics remained relatively constant during the study period, and mostly fluctuated only within a range of 4 percent change. A formal analysis of trend was not possible due to the small number of non-susceptible isolates. These results are similar to those reported in a recent study which analyzed selected representative bacterial isolates from USA and Canadian swine farms (2), and suggest that some of these antibiotics such as beta-lactams and fluoroquinolones, recommended for treating disease caused by these pathogens (3), have retained their clinical efficacy throughout last ten years. These findings are in contrast to results obtained in *Escherichia coli* and *Salmonella* spp. isolates recovered at the MVDL during the same time period, in which a changes in the proportion of susceptible isolates over time were found (particularly in Enrofloxacin susceptibility) (4). Future studies will involve analysis of susceptibility patterns of those antibiotics for which CLSI cut-offs are not available.

References:

1. CLSI. Performance standards for antimicrobial susceptibility testing; twenty-second informational supplement. M100-S22. 2012; 32(3).
2. Sweeney, Michael T., et al. "Antimicrobial susceptibility of *Actinobacillus pleuropneumoniae*, *Pasteurella multocida*, *Streptococcus suis*, and *Bordetella bronchiseptica* isolated from pigs in the United States and Canada, 2011 to 2015." *Journal of Swine Health and Production* 25.3 (2017): 106-120.
3. Cynthia, Kahn. "The Merck Veterinary Manual 10th (tenth) edition." *Merck Sharp & Dohme Corp* (2011).
4. Hong, Samuel., et al. "Serotypes and Antimicrobial Resistance in *Salmonella enterica* Recovered from Clinical Samples from Cattle and Swine in Minnesota, 2006 to 2015." *PLoS one* 11.12 (2016): e0168016.