ORAL PRESENTATIONS

SAMPLING CECAL CONTENTS OR ILEOCECAL LYMPH NODES: IS IT DIFFERENT?

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Summary: The objective of this study was to compare the prevalence of Salmonella enterica in swine populations estimated by sampling cecal contents versus ileocecal lymph nodes. In each of two abattoirs, four groups of pigs (n=30 pigs per group) were studied. Cecal contents and ileocecal lymph nodes were individually collected and processed for isolation and identification of S. enterica. The overall prevalence found by cecal contents was 40%, whereas by ileocecal lymph nodes it was 22.9% (p<0.05). Combining results from both samples, the prevalence found was 50.8%. The relative sensitivity of cecal content sampling was 79.3%, whereas for ileocecal lymph node sampling it was 45.5%. The agreement (Kappa statistic) between both sample types was 13.1%. This study demonstrates that sampling either cecal contents or ileocecal lymph nodes affects results of S. enterica epidemiological studies. It is recommended that both samples be used.

Keywords: Salmonella, Swine, Prevalence, Sample types, Comparison

Introduction: When trying to understand the epidemiology of Salmonella enterica in the pork production chain, sampling represents an important variable to be critically considered. Samples commonly used for diagnosis of subclinical Salmonella infection in market weight pigs include rectal swabs, feces, lymph nodes, cecal contents, and rectal contents. Recent studies (Swanenburg et al.,2001; Hurd et al.,2002) reported variable results based on different sample types, indicating that differences in samples collected may affect results of descriptive and comparative studies. Not only it is common to find studies that compare different sample types (unmatched), but also, it is difficult to compare results between studies, as different sample types are frequently used. The objective of this study was to compare the prevalence of Salmonella enterica in swine populations estimated by sampling cecal contents versus ileocecal lymph nodes.

Materials and Methods: In each of two abattoirs, four groups of pigs were studied (150 pigs per group). From each studied group, 30 animals were randomly selected on the slaughter line. Cecal contents (10g) and ileocecal lymph nodes were individually collected and processed by standard bacteriological methods for isolation and identification of S. enterica, as previously described by Rostagno et al.(2003). Variables analyzed included: the proportion of positive samples by abattoir, by studied group, and by sample type. The data analysis included frequency distribution analysis for each variable, cross tabulations and comparison of proportions, using Chi-square test (p<0.05). The relative sensitivity for cecal content and ileocecal lymph node samples was estimated by comparing the proportion of pigs positive by each sample type to the proportion of pigs positive by at least one of the samples analyzed. The agreement between sample types was determined by the Kappa statistic.

Results: The overall S. enterica prevalence found by cecal contents was 40%, whereas by ileocecal lymph nodes it was 22.9% (p<0.05). The S. enterica prevalence in abattoir A, determined by cecal contents and ileocecal lymph nodes was 36.7% and 27.5% (p<0.05), respectively. In abattoir B, the prevalence found was 43.3% and 18.3% (p<0.05), respectively. Combining results from both samples, the prevalence found was 47.5% in abattoir A, 53.3% in abattoir B, and 50.8% overall. A total of 13 different S. enterica serovars was isolated (11 from cecal contents and 9 from ileocecal lymph nodes). Four serovars were isolated only from cecal contents (Montivideo, Ohio, Mbandaka and Bovis-
morbificans), whereas 2 serovars were only isolated from ileocecal lymph nodes (Choleraesuis var. kunzendorf and 4,12:autoaglutinable). S. enterica serovars isolated from both samples included; Typhimurium var. Copenhagen, Typhimurium, Derby, Anatum, Agona, Newport and Heidelberg. The relative sensitivity of cecal content sampling was 79.3%, whereas for ileocecal lymph node sampling it was only 45.5%. The agreement (Kappa statistic) between both sample types was only 13.1%.

Discussion: This study demonstrates that cecal contents and ileocecal lymph nodes constitute different sources of information on S. enterica epidemiology in swine populations. Their individual use may have impact on results reported. When sampling cecal contents, generally, a higher prevalence is expected, based on its higher sensitivity (79.3 versus 45.5%). However, even though cecal contents are more sensitive than ileocecal lymph nodes, some positive animals will be missed. The poor agreement found (13.1%) indicates that both samples should be considered for a better estimate of the S. enterica prevalence, as they are complementary samples. Our results are in agreement with Swanenburg et al.(2001) and Hurd et al.(2002), reporting difference in prevalence estimates in slaughter pigs, based on different sample types. We hypothesize that the invasiveness of a serovar and the period of time elapsed between exposure and sample collection constitute determinant factors for the prevalence and serovar diversity found in each sample type. Probably, ileocecal lymph nodes reflect on-farm infections and rapid infections acquired from pre-slaughter contaminated environments (transport trailers and abattoir holding pens) by more invasive serovars, whereas cecal contents may reflect both on-farm and rapid infections or contaminations of the gastrointestinal tract after pigs leave the farm.

Conclusions: This study demonstrates that sampling either cecal contents or ileocecal lymph nodes affects quantitative (prevalence), as well as qualitative (serovar diversity) results of S. enterica epidemiological studies. It is recommended that both samples be used to get a better epidemiological picture of S. enterica in swine populations.

References:
