

## Visual-only evaluation of lung lesions as an alternative to palpation at necropsy

Angela Baysinger<sup>1</sup>, Dale Polson<sup>1</sup>, Reid Philips<sup>1</sup>, Micah Taylor<sup>2</sup>, Greg Hartsook<sup>1</sup>, Kelly Lechtenberg<sup>3</sup>

<sup>1</sup>Boehringer Ingelheim Vetmedica, Inc., St Joseph, Missouri; <sup>2</sup>Iowa State University, Ames, Iowa; <sup>3</sup>Midwest Veterinary Services, Oakland, Nebraska; USA  
angela.baysinger@boehringer-ingelheim.com

### Introduction

As swine practitioners become increasingly involved in on-farm research trials, increase their practice geographic areas, and work around stringent biosecurity requirements, their ability to get to farms to perform hands-on necropsies becomes more difficult. We evaluated a potential alternative to hands-on evaluation of lung lesions in order to address these challenges. The objective of this study was to evaluate the inter-observer and inter-method reliability of visually scoring lungs for *Mycoplasma hyopneumoniae* lesions from digital images and from visual scoring of actual lungs with the benefit of palpation at necropsy.

### Materials and Methods

This study evaluated lungs from 344 pigs in a *M. hyopneumoniae* challenge study.<sup>1</sup> The lungs were from pigs in five treatment groups; one strict control, one non-vaccinated and challenged, and three *M. hyopneumoniae* vaccinated and challenged groups. The pigs were euthanized and necropsied 28 days post *M. hyopneumoniae* intra-tracheal challenge. Removed lungs were observed and palpated by two veterinarians who independently scored each lobe as a percentage of the area affected by *M. hyopneumoniae* (necropsy evaluation). *Mycoplasma*-induced lesions were defined as dark-red-to-purple consolidated areas. Observations and digital images for each lung were completed within 15 minutes of being removed from the pig. The digital images were later presented to the same observers, who visually evaluated and scored the lungs as described above, without the benefit of palpation (image evaluation). Lung scores were weighted by the approximate volume each lobe contributes to total lung volume to derive a value for total percent lung affected, as previously described.<sup>2</sup> A linear regression model was used to determine the correlation of necropsy versus image evaluation as well as inter-observer reliability for both methods.

### Results

The mean score across both observers for image evaluation was 8.21%, while the mean score for necropsy evaluation was 6.21%. Means for image evaluation were 10.32% and 5.89% and for necropsy

evaluation were 7.64% and 4.77% for observer 1 and 2, respectively. The linear regression showed a good fit of the data for all three parameters, including image versus necropsy (adjusted  $R_2=0.76$ ,  $p<0.001$ ), image between observers (adjusted  $R_2=0.67$ ,  $p<0.001$ ), and necropsy between observers (adjusted  $R_2=0.84$ ,  $p<0.001$ ). The correlation coefficients were 0.873, 0.819, and 0.921, respectively, suggesting very good correlation.

### Discussion

There was a high correlation between the image and necropsy evaluation and between the observers for both methods. There did appear to be a better correlation between observers when scoring at necropsy with the benefit of palpation, suggesting that palpation remains a more consistent method of evaluating lung lesions. However, image evaluation appears to be a potential alternative to necropsy evaluation. Practitioners that are unable to necropsy pigs because of biosecurity or time restrictions now have another tool to evaluate the respiratory health of their client's pigs. Practitioners may also utilize this tool to send images to experienced lung scorers to assist in their on-farm research trials. Overall, visual evaluation with the benefit of palpation is still the preferred method.

### References

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2. PigMON<sup>(R)</sup> slaughter inspection procedures manual. USDA National Animal Health Monitoring System and the University of Minnesota Swine Group. June 1992.