ASSOCIATION BETWEEN COUGHING, PNEUMONIA INDEX AND PLEURISY

THAÍS G BARALDI[1]*, NATHAN R N CRUZ[1], FILIPE A D COSTA[1], DANIELE A PEREIRA[1] , GABRIEL Y STORINO[1] , LUÍS GUILHERME DE OLIVEIRA[1]

[1] São Paulo State University (UNESP) – Jaboticabal, São Paulo
*Corresponding author: xxxxx@hotmail.com

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Introduction Diagnosis of respiratory diseases in pigs' herds is a three steps method: clinical signs, pathological examination of lung tissue and detection of pathogen in affected tissue. Coughing is the principal symptom and provides a good clinical examination, but will not identify the etiology. The porcine respiratory disease complex in 16-20 week old pigs can include primary infections by *Mycoplasma hyopneumoniae* (Mh), *Actinobaccillus pleuropneumoniae*, PRRS and SIV (THACKER & MINION, 2012), be influenced by co-infections with bacterial pathogens (e.g. *Pasteurella multocida*, and *Bordetella bronchiseptica*) and non-specific infections which coughing can be simultaneously in various age groups of the herd. However, a dry and non-productive cough is a typical symptom of enzootic pneumonia (EP) in growing and finishing pigs, and when associated with detection of Mh in the same pigs, could be used for diagnosis purposes (NATHUES et al, 2012). Moreover, understanding clinical signs in live pigs with pleurisy would improve and timely target the control measures, since often asymptomatic animals are common and the disease is only identified at slaughter (AUGUSTIJN et al., 2008). Thus, the objective of this study was to evaluate the associations between coughing index, pneumonia index and pleurisy in 11 herds in São Paulo state

Materials and methods All the 11 herds had one-site production system with a minimum size of 240 sows and maximum of 1500 sow, where were proceeded the clinical examination (coughing) and pathological examinations of lung lesions at slaughterhouse. Clinical examination: in each herd, a group of fattening pigs aged 16-18 weeks was clinically examined. Pigs of this age group were usually housed in one or two compartments. If more than one compartment contained the chosen pigs, the examined compartment was selected at random, as were the selected pens within each compartment. In order to measure the coughing index, pigs from one pen were forced to move by shouting and clapping. The number of coughing bouts was then counted for 1 minute. Pigs could have more than one coughing bout measured within the period of observation when coughing was absent for 10 seconds before reappearing. The lungs were scored for severity of EP-like lesions using the method described by PIFFER & BRITTO (1991). EP-like lesions were defined as macroscopic greyish to purplish consolidated pneumonia areas, generally located on the cranio-ventral parts of the lung lobes. The lungs scores result in Pneumonia Index (PI) capable to analyze the pneumonia severity incidence in the herd level. Then were further divided into three groups according to their presumed current level of respiratory diseases, i.e. low (IP = 0.90). The lungs were also evaluated for the presence of pleurisy, which was defined as fibrotic adherences between the parietal and visceral membranes of the pleural cavity (RUBIES et al., 1999) Statistical analyses: herds were separated into groups vaccinated a non-vaccinated and correlations between coughing index, PI and pleurisy were assessed using Pearson's correlation in each group of vaccinated and non-vaccinated piglets and piglets of vaccinated non-vaccinated sows Moreover, in case of two variables were highly correlated (r > 0.6), the most significant factor was retained. Association of coughing index, PI and pleurisy.

Results and discussion Herds that respiratory diseases were present, fattening pigs usually showed a dry and non-productive cough. Coughing index ranged from 4.2% to 26.9%; the median was 6.3%. The correlation between coughing index and PI (Figure 1) and pleurisy was weak (Figure 2). However, the

number of herds analyzed is very small yet. In case the number of herds increase, the negative tendency observed in the regression coefficient became significant. The severity of EP-like lesions was lower when batches presenting lower coughing index (R^2 = - 0.098) and for pleurisy results (R^2 = - 0.07). As a tendency behavior results for association between coughing, PI and pleurisy more evaluations of batches from other herds must be included in this study, which is still in progress. But even in beginning demonstrated coughing index as valuable procedure and a reliable association with PI to measure respiratory diseases in herds as demonstrated by MORÉS et. al (1999). NATHUES et al, 2012 indicated the detection of Mh was strongly associated with the coughing index of the same herds, which had over 50% positives lavage fluids and the mean coughing was >2.5%. Furthermore, also indicated in this study the coughing index (based on chronic, dry and non-productive coughing) as a capable assumption for herds which are suffering from EP. Regarding associations between coughing index and pleurisy were similar to previous studies, which dyspnea and coughing in pigs > 30 Kg were related with pleurisy (JÄGER et al., 2012). Moreover, respiratory disease in late finishing pigs was associated with the presence of pleurisy (FRAILE et al 2010). However, these clinical observations may indicate other co-existent respiratory disease, making this unspecified clinical observation for pleurisy. Because coughing and lethargy are considered to be indicative, but not specific for pleurisy (AUGUSTIJN et al., 2008)

Conclusion The accurate and complete diagnosis of enzootic pneumonia at herd level should base on combinations of different methods, connecting clinical signs, lung lesions and laboratory tests. The present study showed that quantify bouts of coughing in growing and finishing pigs can improve the diagnosis if along with different techniques. Therefore, the measurement of coughing index is an affordable practice with a potential capacity to indicate respiratory problems at pig herds.

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