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OFFICIAL MONITORING PROGRAM FOR PEDV IN BREEDING SWINE IMPORTS IN BRAZIL

Danielle Gava[1], Vanessa Haach[2], Rejane Schaefer[1] & Janice Reis Ciacci Zanella[1]

[1]*EMBRAPA Swine and Poultry, Brazil.*

[2]PIBIC, CNPq - Universidade *do Oeste de Santa Catarina (UNOESC), Brazil.*

Introduction

The porcine epidemic diarrhea virus (PEDV), a member of the *Coronaviridae* family, causes acute watery diarrhea and dehydration in pigs (1, 2). Lesions are typical of acute viral enteritis, with severe atrophy of villi and attenuation or erosion of epithelial cells (2). PEDV is common in parts of Asia and Europe and was first confirmed in the U.S in May 2013 (1, 3). Up to the present time, 32 U.S states have reported PEDV and it is estimated to have killed up to 8 million pigs (3). While researchers are still trying to determine how the virus arrived in North America, negative countries expanded their surveillance testing and restricted their biosecurity to avoid outbreaks.

In July 2014, Brazilian Agriculture Ministry (MAPA) increased swine import requirements to prevent the entry of swine infected with PEDV into Brazil. This included negative tests for PEDV prior to shipping and after entrance in Brazilian territory.

PEDV diagnostic cannot be based only on clinical signs or histopathological lesions. Due to similarities to other causative agents of diarrhea, differential laboratory techniques must be used to identify PEDV. In this scenario, RT-qPCR has been shown to be a sensitive, rapid and cost-effective method (1, 2, 3).

The present work shows the monitoring program of PEDV in imported pigs in Brazil.

Materials and methods

Sampling: Feces from 409 breeding swine imported from U.S and Europe were collected in a quarantine facility from MAPA located in Cananeia, São Paulo state, during 2014.

RNA extraction: Viral RNA was extracted from homogenized feces with a standard trizol and chloroform extraction procedure combined with silica based extraction (RNeasy Mini Kit - Qiagen).

RT-qPCR: The reaction was carried out using specific primers and probe designed for S gene, as previously described (4) with minor modifications. Five uL of each RNA sample was used in PCR set-up for a 25uL total reaction using AgPath-ID One Step RT-PCR Kit (Life Technologies). The RT-qPCR was run using an Applied Biosystem 7500 system as follows: 50°C for 15 min, 95°C for 10 min, amplified for 45 cycles at 95°C for 15 sec, followed by 60°C for 45 sec.

A synthetic positive control of the reaction, based on the S gene, was designed and a set of standards were included in each RT-qPCR plate.

Results

No clinical signs were observed in sampled pigs. RT-qPCR was negative in all tested feces samples.

Discussion

The economic impacts of PEDV are substantial, given that it results in significant morbidity and mortality in neonatal piglets. Besides, PEDV infection is associated with increased costs related to vaccination and disinfection (1, 2).

Coordinated efforts between producers, industry, veterinarians, regulators and research institutes as Embrapa are in place to avoid the entrance or even transmission of PEDV in Brazil. Brazilian veterinarians following the PEDV outbreaks took official and non-official measures. Those measures included (a) sanitary education (information about the disease, biosecurity and disinfection improvement protocols), (b) avoid or minimize visitors from overseas into the farms, (c) increase caution on the import of genetic material, ingredients, additives for nutrition, equipment; (d) have laboratory tests for rapid diagnosis (investigate suspected cases of PEDV and (e) monitory of imported live pigs) (5).

Although no PEDV nucleic acid was detected in the analyzed samples or no clinical signs were identified in the imported pigs, it does not eliminate the risk of PEDV entrance. Appropriate contingency plans are warranted to mitigate the risk of transmission across the susceptible population.

Acknowledgements

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References

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