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Evaluation of the pathogenecity and transmissibility of a Chilean isolate of Porcine Reproductive and Respiratory Syndrome Virus.

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Introduction

Porcine Reproductive and Respiratory Syndrome (PRRS) is considered one of the most economic important diseases in swine industry today. The disease is widely distributed world-wide, been first diagnosed in Chile by the beginning of the year 2000 throughout a routine governmental surveillance. At the present time, a control and eradication program is in a final phase[1], however, little is known about the level of pathogenecity and transmissibility of the PRRSV strains isolated from Chile. The objective of this study was to determine the shedding and transmission patterns, and infectious capacity of the PRRSV Chilean isolate.

Materials and Methods

Thirty pigs, divided in six groups of five, 4-week-old, animals each were used. The G1 (donor) group was inoculated with PRRSV (2 and 1 mL respectively, $10^{5.4}$ $TCDI_{50}$ intranasally and intramuscularly), maintained in an isolation unit for 35 days, and sampled at 0, 3, 7, 11, 15, 19, 23, 27, 31 and 35 days post inoculation (dpi) to determine viraemia (RT-nPCR ORF7), seroconversion (ELISA, IDEXX®) and shedding in nasal, ocular, saliva and faeces swabs (RT-nPCR ORF7). An uninfected control group (G6) was equally maintained and sampled under strict isolation. Other four groups (G2, G3, G4, G5) were used as a susceptible (sentinel) animal, being in direct contact with G1 between 3 to 7, 10 to 14, 17 to 21 and 24 to 28 dpi, respectively and were later placed in an independent isolation unit to monitor infection status for 7 days. All the animals in G1 and G6 were sacrificed at 35 dpi and the contact groups at 12 days post-contact (dpc). Samples were obtained from nasal turbinate, tonsils, lymph nodes (submandibular, medial retropharyngeal and cranial mediastinic), lung, spleen, liver, ileum, colon and kidney for histopathological and immunohistochemical (IHC) analysis.

Results and Discussion

No clinical symptoms were evident in any group, except for a transient fever observed in G1 between 3 and 4 dpi. At necropsy, the inoculated pigs (G1) presented periocular edema and lymphoadenopaty. All pigs of the contact groups also presented signs of enlarged lymph nodes. No lung gross lesions were observed in any pig. Histopathologically, all the animals of G1 had interstitial pneumonia, although scarce PRRSV-positive cells were detected in the lung using IHC. PRRSV-positive cells (IHC) were detected in the lymphoid tissue of all animals in contact groups, but especially in G3 and G4. Viraemia and seroconvertion was detected in G1 (3–35 dpi and 11-35 dpi, respectively) and in the all contact groups (5–12 dpc and only 12 dpc, respectively). PRRSV was detected in nasal and ocular secretions (7 to 19 dpi, respectively), saliva (11 to 35 dpi) and faeces (7 to 19 dpi) (Table 1). Under the conditions of this experiment, it could be concluded that the critical period for the shedding of the PRRSV Chilean isolate could occur between 11 and 19 dpi, a period during which the interaction of the four shedding routes studied by us (and previously by others [2,3]) – the nasal, ocular, salival and faecal routes – takes place. Based on this experiment, the nasal route would be the earliest and the saliva perhaps the most persistent and long-lasting excretion route over time, at least until 35 dpi.

Table 1. PRRSV detected from nasal, ocular and salival secretions and faeces in G1 inoculated group pigs.

N° positive pigs/N° of analyzed pigs										
DPI	**0**	**3**	**7**	**11**	**15**	**19**	**23**	**27**	**31**	**35**
Nasal	**0/5**	**3/5**	**4/5**	**4/5**	**4/5**	**4/5**	**0/5**	**0/5**	**1/5**	**1/5**
Ocular	**0/5**	**0/5**	**5/5**	**2/5**	**3/5**	**2/5**	**0/5**	**0/5**	**0/5**	**0/5**
Saliva	**0/5**	**0/5**	**0/5**	**4/5**	**2/5**	**4/5**	**2/5**	**2/5**	**1/5**	**2/5**
Feces	**0/5**	**0/5**	**2/5**	**1/5**	**3/5**	**4/5**	**0/5**	**0/5**	**0/5**	**0/5**

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