

Modelling Porcine Epidemic Diarrhoea Virus (PEDV) spread in a pig densely populated area in France without population immunity

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Aims

- Assess the transmission dynamics of PEDv whenever introduced in a pig densely area in Europe using modeling

Assess the impact of control measures on disease spread

Material & Methods

Main characteristics

• Spatio-temporal stochastic individual-based model • Parameterization: data extraction from a national database reporting • Geographical location, farm type and size

Herd health states and transitions



• Animal movements between herds • Frequency of contacts with vehicles and other mechanical vectors Use of the North American Animal Disease Spread Model (NAADSM) (Harvey et al., 2007)

Application to the most densely populated area in France



Transition parameters:

Martelli et al., 2008; Pensaert and De

Bouck, 1978; Poulin and Klopfenstein, 2013

Results

Simulated epidemics without intervention

Simulated epidemics in Brittany, FR



Observed data in the US



⇒ small area, densely populated ⇒ faster increase \Rightarrow lower peak incidence compared to US (80 versus 300)

Impact of interventions on the simulated epidemics



lay detection	
■ Mean 【• 25%	Key messages
12 75%	
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Harvey, N., A. Reeves, et al. (2007). "The North American Animal Disease Spread Model: A simulation model to assist decision making in evaluating animal disease incursions." Preventive Veterinary Medicine 82(3-4): 176-197.

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