



VIRAL DISEASES

VVD-049

MODELLING AFRICAN SWINE FEVER INTRODUCTION AND GEOGRAPHICAL EXPANSION IN FRANCE AND EVALUATION OF DETECTION AND CONTROL POTENTIAL

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Introduction

Being a notifiable disease, the emergence of African swine fever in disease-free countries has huge economic consequences mainly due to export ban. Moreover, with a case fatality rate close to 100%, ASF represents a major threat for the swine industry. Recent ASF outbreaks in eastern Europe revealed the need of prospective approaches to analyse the consequences of the introduction and spread of ASF at the country level. We used a modelling framework to analyse the consequences of potential ASF emergence in France in terms of requirements for detection and control.

Material & Methods

The national swine identification database, reporting live-pigs movements in France, was analysed to derive distance-related probabilities of contact occurrence between the different types of farms of the swine production network. These specific data were further used to feed a simulation model developed in Denmark representing the spread of ASF (DTU-DADS-ASF model) within and between farms along with realistic control measures defined in the national emergency plan (movements restriction, establishment of protection and surveillance zones, depopulation,...).

Results

A high heterogeneity in the density of swine production units in France was highlighted and 10 herd types were identified. Four density zones, each including 25% of swine production sites, were determined. The epidemics characteristics were compared depending on the density-zone of the index case. Slight variations were found in terms of detection-delay but the number of surveillance visits was increased up to four times according to the index case location. The infection was largely disseminated throughout the country when the index case was in low-density areas but was geographically contained in highly populated ones.

Discussion & Conclusion

The location of the index case is a determining factor to consider to mobilize sufficient resources for active surveillance in case of emergence of ASF in France.