Modeling the Effects of Duration and Size of the Control Zones on the Consequences of a Hypothetical African Swine Fever Epidemic in Denmark

African swine fever (ASF) is a notifiable infectious disease. The disease is endemic in certain regions in Eastern Europe constituting a risk of ASF spread toward Western Europe. Therefore, as part of contingency planning, it is important to continuously explore strategies that can effectively control an epidemic of ASF. A previously published and well-documented simulation model for ASF virus spread between herds was used to examine the epidemiologic and economic impacts of the duration and size of the control zones around affected herds. In the current study, scenarios were run, where the duration of the protection and surveillance zones were reduced from 50 and 45 days to 35 and 25 days or to 35 and 25 days, respectively. These scenarios were run with or without enlargement of the surveillance zone around detected herds from 10 to 15 km. The scenarios were also run with only clinical or clinical and serological surveillance of herds within the zones. Sensitivity analysis was conducted on influential input parameters in the model. The model predicts that reducing the duration of the protection and surveillance zones has no impact on the epidemiological consequences of the epidemics, while it may result in a substantial reduction in the total economic losses. In addition, the model predicts that increasing the size of the surveillance zone from 10 to 15 km may reduce both the epidemic duration and the total economic losses, in case of large epidemics. The ranking of the control strategies by the total costs of the epidemics was not influenced by changes of input parameters in the sensitivity analyses.

General information
State: Published
Organisations: National Veterinary Institute, Epidemiology, Virology, Ministry of Environment and Food of Denmark
Contributors: Halasa, T., Bøtner, A., Mortensen, S., Christensen, H., Wulff, S. B., Boklund, A.
Number of pages: 7
Publication date: 2018
Peer-reviewed: Yes

Publication information
Journal: Frontiers in Veterinary Science
Volume: 5
Article number: 49
ISSN (Print): 2297-1769
Ratings:
BFI (2018): BFI-level 1
BFI (2017): BFI-level 1
Scopus rating (2017): CiteScore 1.94
Original language: English
Keywords: African swine fever, Control, Model, Simulation, Surveillance
Electronic versions:
fvets_05_00049.pdf
DOIs:
10.3389/fvets.2018.00049

Bibliographical note
This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY). The use, distribution or reproduction in other forums is permitted, provided the original author(s) and the copyright owner are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.
Source: FindIt
Source-ID: 2398015754
Research output: Research - peer-review › Journal article – Annual report year: 2018