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In 2008, total Danish pork exports were evaluated at €3.6 billion, corresponding to approximately 5% of the total Danish exports. An outbreak of a notifiable disease might, therefore, have a dramatic consequence for the agricultural sector in Denmark. The objective of this study was to simulate the epidemiological and economic consequences of such control strategies under Danish conditions with respect to herd demographics and geography as well as to investigate the effect of extra biosecurity on farms. We used InterSpread Plus to model the effect of nine different control strategies: the minimum measures required by the EU plus depopulation of contact herds (EUplus), extra depopulation of neighbouring herds, extra surveillance of neighbouring herds, extra surveillance within the protection and surveillance zones, extra biosecurity in SPF herds – or in all herds, vaccination of all pigs in the 1 or 2 km zones as a protective measure (vaccination-to-kill), vaccination of all weaners and finishers in the 1 and 2 km zones as a suppressive measure (vaccination-to-live). Each epidemic was simulated to start in four different index herds: production herd located in low, medium and high pig density areas, respectively; and a nucleus herd in an area of high pig density. For each control strategy and index case, we calculated the size and duration of the epidemic, the number of depopulated and/or vaccinated herds and animals, the control costs borne by the public and the pig industry, respectively, as well as the lost exports associated with the epidemic. The simulation showed that the EUplus strategy is the most effective of the evaluated strategies with respect to limiting size, duration and costs of the epidemic, regardless of the index case.

However, regarding the number of slaughtered animals, the vaccination-to-live strategy appeared to be more effective. Epidemics become larger and longer if the index case is a nucleus herd. This implies that biosecurity in nucleus herds is extremely important to avoid transmission of CSF to these herds. In the Netherlands in 1997-98, many herds were involved in a large epidemic (Elbers et al, 1999). However, many epidemics include a smaller number of infected herds, as was the case in Germany in the 1990s (Fritzemeier et al., 2000) and in England in 2000 (Mackinnon, 2001). Simulations showed that a Danish CSF epidemic will be moderate in most cases and will include fewer than ten cases and last less than 2 weeks on average. However, for some iterations, long-lasting and large epidemics were observed. Irrespective of the size and duration, an epidemic is expected to be very costly due to the export losses. Elbers,A.R.W., Stegeman,A., Moser,H., Ekker,H.M., Smak,J.A., Pluimers,F.H., 1999. The classical swine fever epidemic 1997-1998 in The Netherlands: descriptive epidemiology, Prev.Vet.Med., 42, 157-184. Fritzemeier,J., Teuffert,J., Greiser,Wilke,I, Staubach,Ch, Schlüter,H., Moennig,V., 2000. Epidemiology of classical swine fever in Germany in the 1990s, Vet.Microbiol. 77, 29-41. Mackinnon, J.D., 2001. Some clinical and epidemiological aspects of the outbreak of Classical Swine Fever in East Anglia in 2000, State Vet.J., 11, 2-7.