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Detection of CSF-suspect cases based on clinical signs is difficult. Low specificity of the clinical signs causes the CSF-suspicion to be highly uncertain for a long period.
In order to supply practitioners and state-veterinary-officers with an objective tool to early identify CSF-suspect situations, we developed a clinical decision-support system (CDSS). The system builds upon a probabilistic network, which essentially is a graphical model of a probability distribution over a collection of stochastic variables. The network models the pathogenesis of the disease and includes stochastic variables related to infection and to clinical signs that may occur as a consequence of infection. A prototype of the system is currently operational.
The ability of the CDSS to detect CSF-infected pigs was evaluated using inoculation experiments from Germany, United Kingdom, Denmark and the Netherlands. A total of 128 pigs in 23 experimental groups were inoculated with CSF-virus varying in virulence. For highly virulent CSF-strains, the CDSS was able to detect infected piglets 5-7 days post infection (dpi). For less virulent CSF-strains, infected piglets were detected 14-17 dpi.
The specificity of the model was evaluated using field data, collected by practitioners from the Netherlands, Belgium, Denmark, Italy and Germany. Data was collected from 408 sick pigs for which CSF was in the differential diagnosis but not the first to think of as a possible cause. Given the threshold values of alpha=0.005, 0.01 and 0.05 (a priori probability of CSF being present in the country), the specificity of the CDSS was 96.6%, 97.8% and 99.5%, respectively.