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Detection of CSF on a pig farm in Finland

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Abstract

Finland has not experienced CSF epidemics since 1917, therefore, a low disease awareness is assumable. By simulating the course of decisions leading eventually to CSF analysis, the distribution for the time passed before CSF would be detected on a pig farm in Finland was estimated. Results achieved agreed with previously published; CSF would be detected earlier on a fattening farm than on a piglets producing farm. Overall, several weeks will most probably pass before CSF will be detected in Finland, resembling real CSF epidemics occurred in Europe.

Materials and methods

- Monte Carlo simulation model (MatLab™)
- Initial parameters estimated from questionnaires, laboratory and official statistics,
- Clinical signs according to publications, assumed pathogenesis as in Belgium -94
- As event reoccurs uncertainty increases
- 10,000 iterations for each farm type

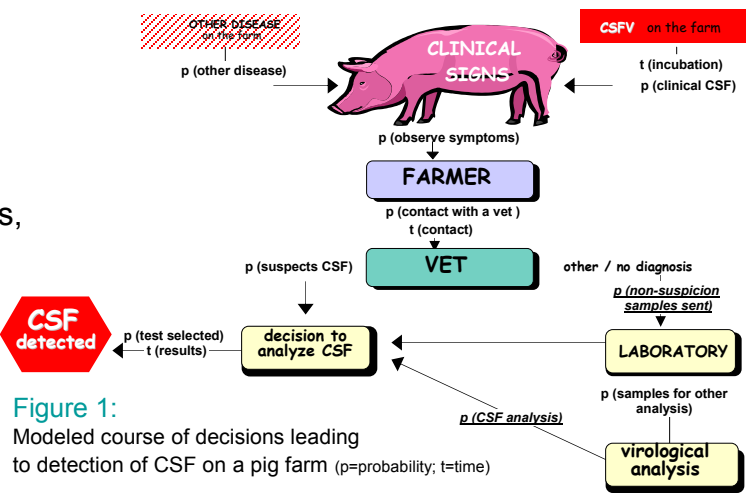

Figure 1:
Modeled course of decisions leading to detection of CSF on a pig farm (p=probability; t=time)

Results

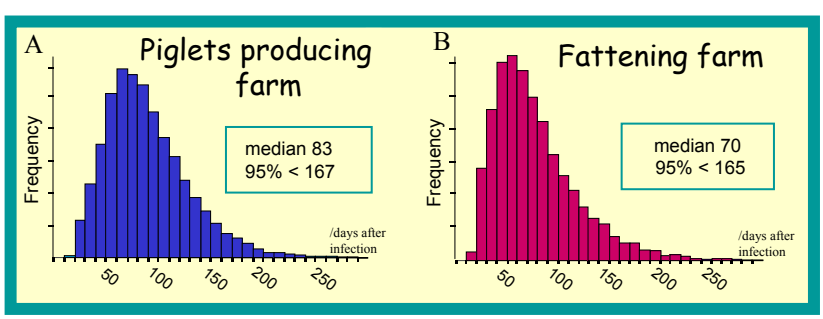

Figure 2:
Probability distribution to detect CSF (as days after infection) on an infected:
(A) Piglets producing farm
(B) Fattening farm
(distributions could be approximated by:
(A) X~NEGBIN (S=6; P=0.0627), $t=0.00153X^2+0.74807X+8.16345$
(B) X~NEGBIN (S=4; P=0.0475), $t=0.00185X^2+0.68805X+11.51152$)

Table 1:
Elapsed time, as days after infection, until first reactions and the probability for a detection promoting response due to first occurrence of the event
(values for a piglets producing farm; *IQR* = interquartile range; * = $x10^{-3}$; **suspicion lead directly to CSF analysis)

Infection	First occurrence of an event after infection	median day (*IQR*)	probability for desired response to follow first occurrence	*p*- mean (*IQR*)
	any symptom observable	16 (11 - 23)	contact with a vet	.55 (.42 - .63)
	contact with a vet	28 (20 - 38)	CSF suspicion**	.12* (.07 -.17*)
			send non-suspicion samples	.02 (.01 - .05)
	non-suspicion samples sent	48 (35 - 64)	virological analysis	.21 (.20 - .22)
	virological analysis	52 (39 - 69)	CSF analysis	.13 (.04 - .21)
	CSF analysis	82 (60 - 110)	CSF detected	.99 (.99 - .99)
Detection				

Conclusions

- Expected detection time for CSF in Finland, as revealed by the model, corresponds to the required time to detect CSF previously in other EU countries
- Increased initial *p(non-suspicion samples sent)* and *p(CSF analysis)* most effectively shorten detection time