

# Current State of ASF in Europe

*K Depner*

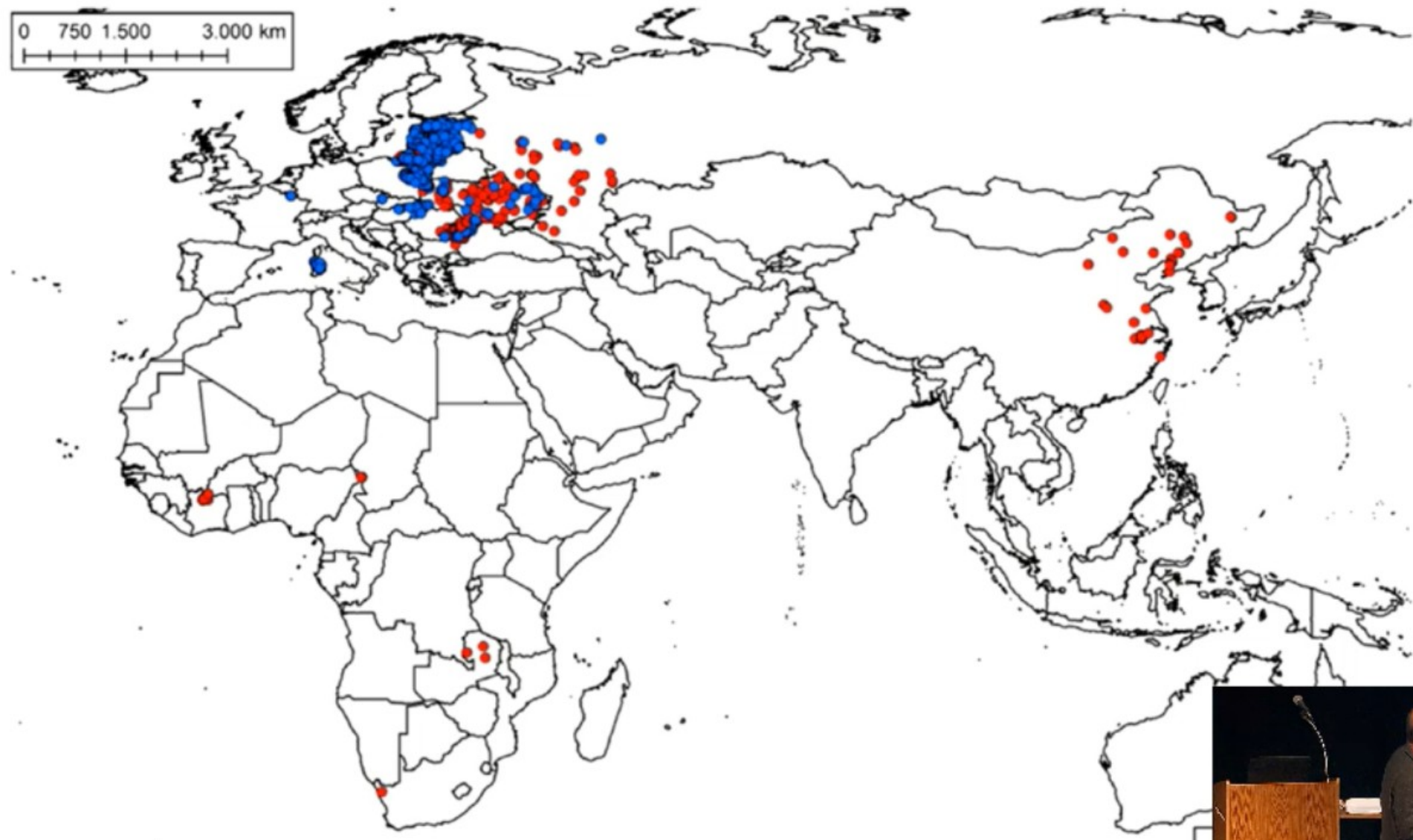
*1 November 2018*

*Ames, Iowa, USA*





## ASF 2018



(Source: ADNS & OIE WAHIS)

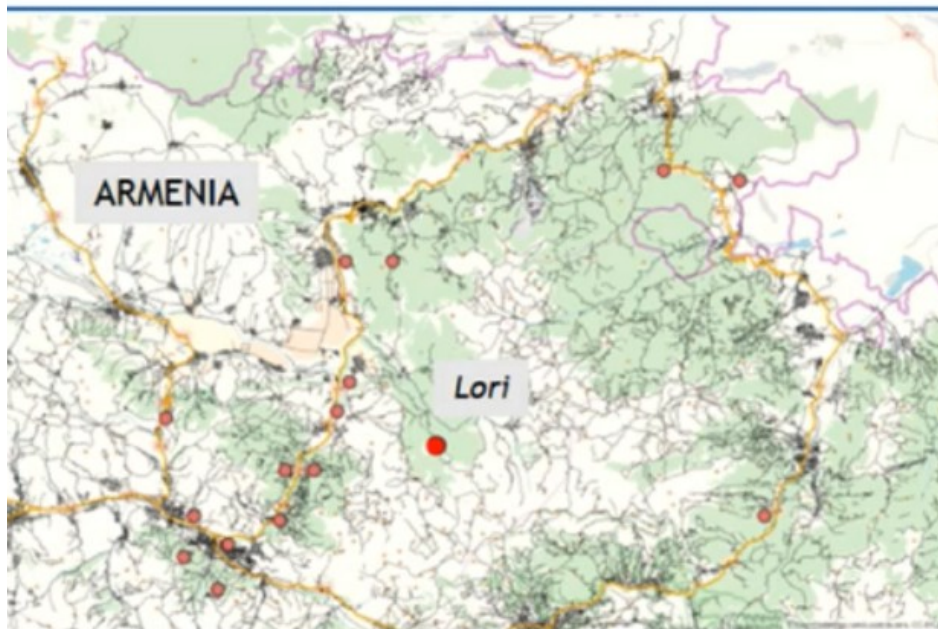


ASF is a human driven disease  
(*“anthropogenic factors”*)

ASF 的蔓延主要是 “人祸”

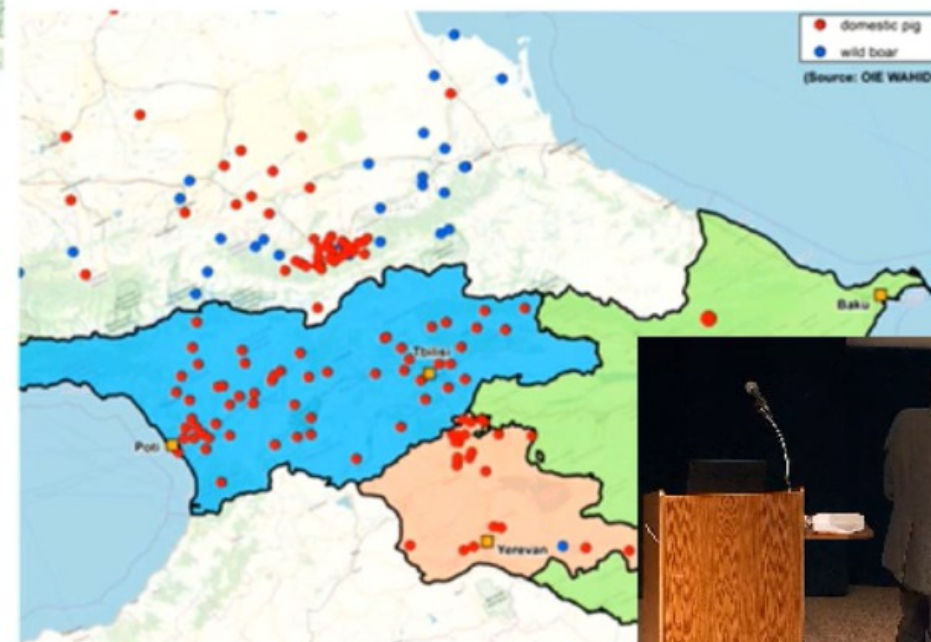


# ASF is a human driven disease (“anthropogenic factors”)



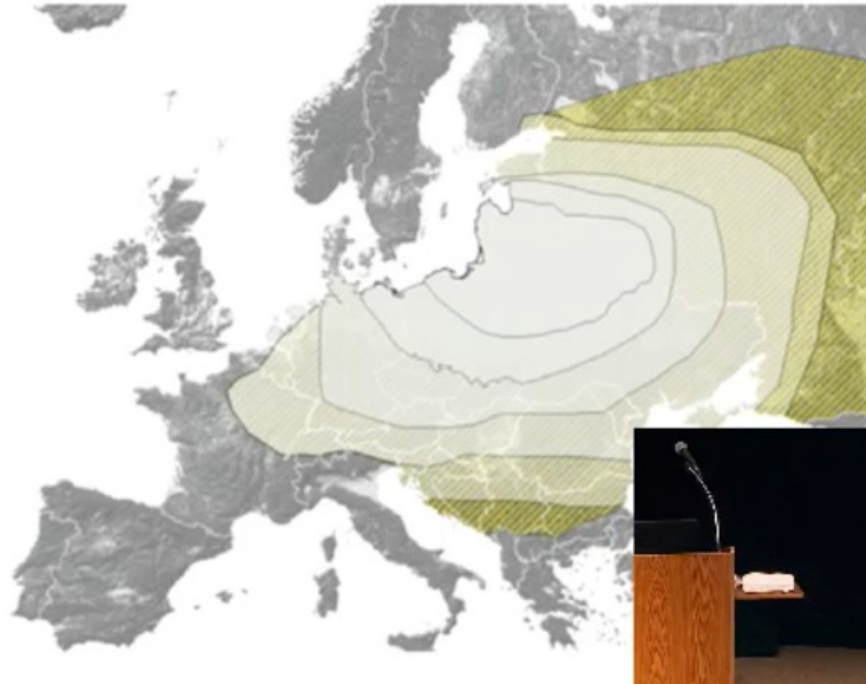
Along the road

Tradition



1) ASF **will fade out rapidly** from the affected wild boar population due to the high mortality rate induced by the ASFV (**IMPLOSION**)

2) ASF **will spread rapidly** westwards (Rabies like) since an infected local wild boar population would infect the naïve neighboring populations within a short period of time initiating an epidemic wave... (**EXPLOSION**)





## ASF: Working hypotheses for wild boar

1) ASF **will fade out rapidly** from the affected wild boar population **years later.....**

ASFV (IMF)

both hypotheses proved to be wrong !!!

2) ASF **will**

westwards • NO implosion

an infected • NO explosion

population

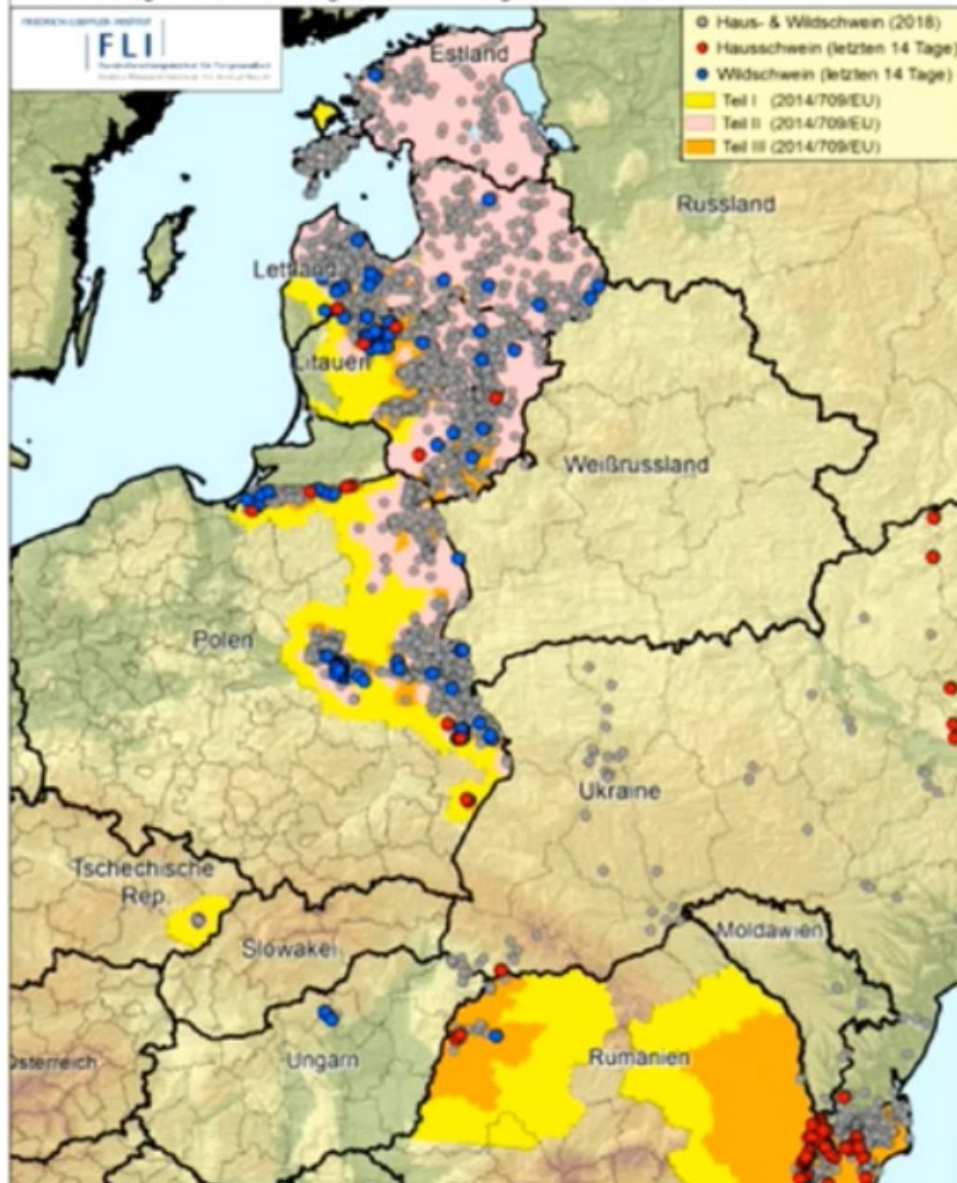
naïve neighbor => **Endemic in the region, slow spread**

within a short period of time  
initiating an epidemic wave...

(EXPLOSION)



**Afrikanische Schweinepest im Baltikum, Moldawien, Polen, Rumänien, Tschechien, Ungarn und Ukraine**  
Datenquelle: ADNS, OIE (Stand: 28.08.2018 - 08:25 Uhr) nach Feststellungsdatum;  
Restriktionsgebiete nach Anhang des Durchführungsbeschlusses 2014/709/EU





## How much do we need to know about ASF to be able to prevent, control and eradicate?

- Something about the virus
  - Something about the clinical course
  - Something about diagnosis
  - Something about contagiousity, infectiosity, transmission...
- 
- Much about epidemiology
- 
- Very much about  
    **human - host interactions**
  - Very much about  
    **human behaviour**



# 4 epidemiologic cycles of ASF



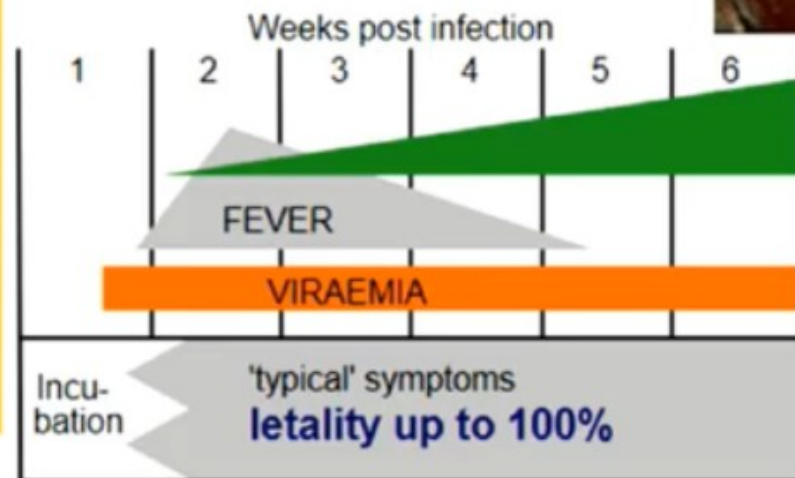
- Ch
- 1) Sylvatic cycle: the common warthogs; bushpigs and soft ticks.
  - 2) Tick-pig cycle: soft ticks; domestic pigs.
  - 3) Domestic cycle: domestic pigs and pig products.
  - 4) Wild boar-habitat cycle: wild boar; pig- and wild boar products and carcasses.



# A bit about ASF

- ✓ Scientific information available
- ✓ Knowledge about ways & routes of transmission
- ✓ Diagnostic tools available

## Acute course of ASF



If we do not manage ASF, it's not because of lack of knowledge...





# ASF virus is relatively stable

- frozen meat: indefinitely
- dry meat and fat: almost one year
- blood, salted meat and offal: more than 3 months
- faeces: over one week

*Temperature plays an important role in decreasing the survival duration of ASF virus in any matrix.*



**ASFV survives the process of putrefaction and carcasses may remain infectious for weeks**



## *Textbooks are misleading...*

*copy/paste ...*

*“ASF is a highly contagious disease... causing high mortality up to 100%...”*

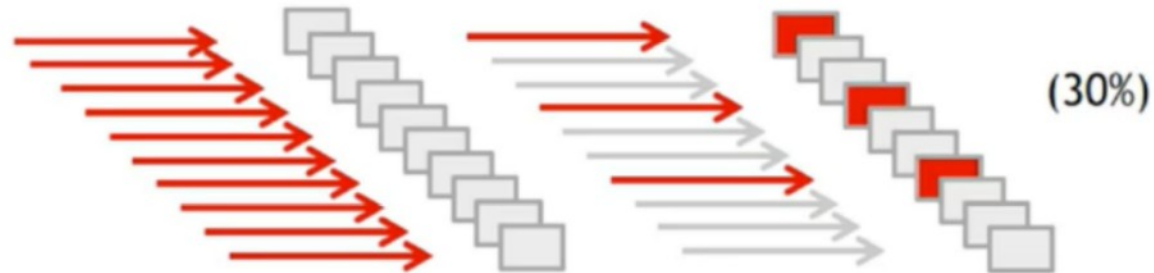
- *Mortality: Dead animals / epidemiological unit*
- *Case fatality (lethality): Dead animals / infected animals*



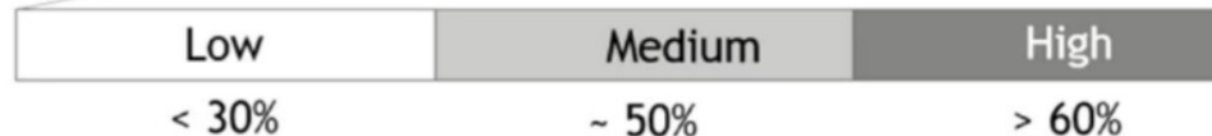
# Contagiousity/Contagiousness

percentage of animals which get infected after contact with an infectious agent.

*probability that an animal picks up an infection after contact with a pathogen*

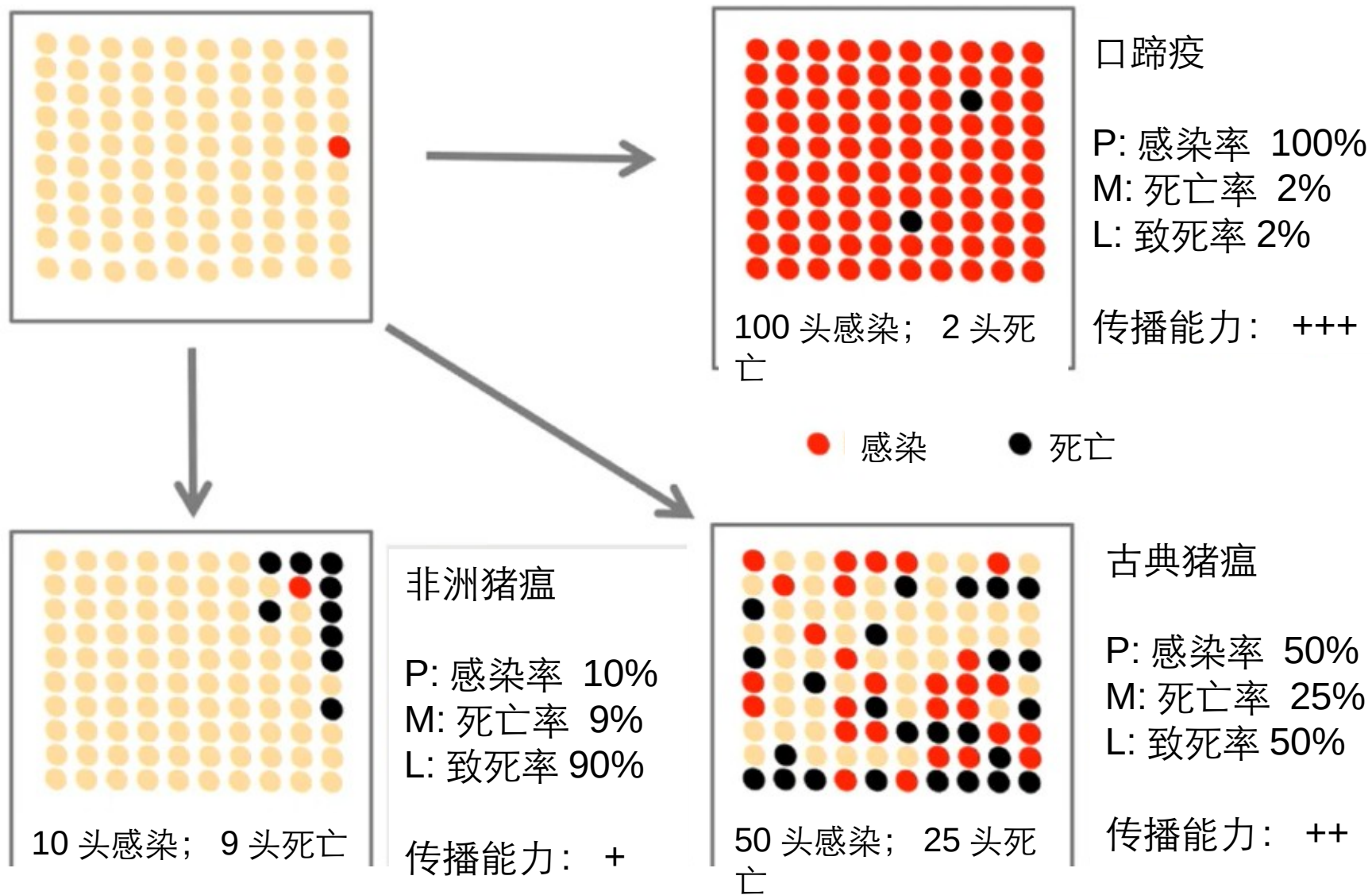


**Contagiousness**  
**Probability of infection**

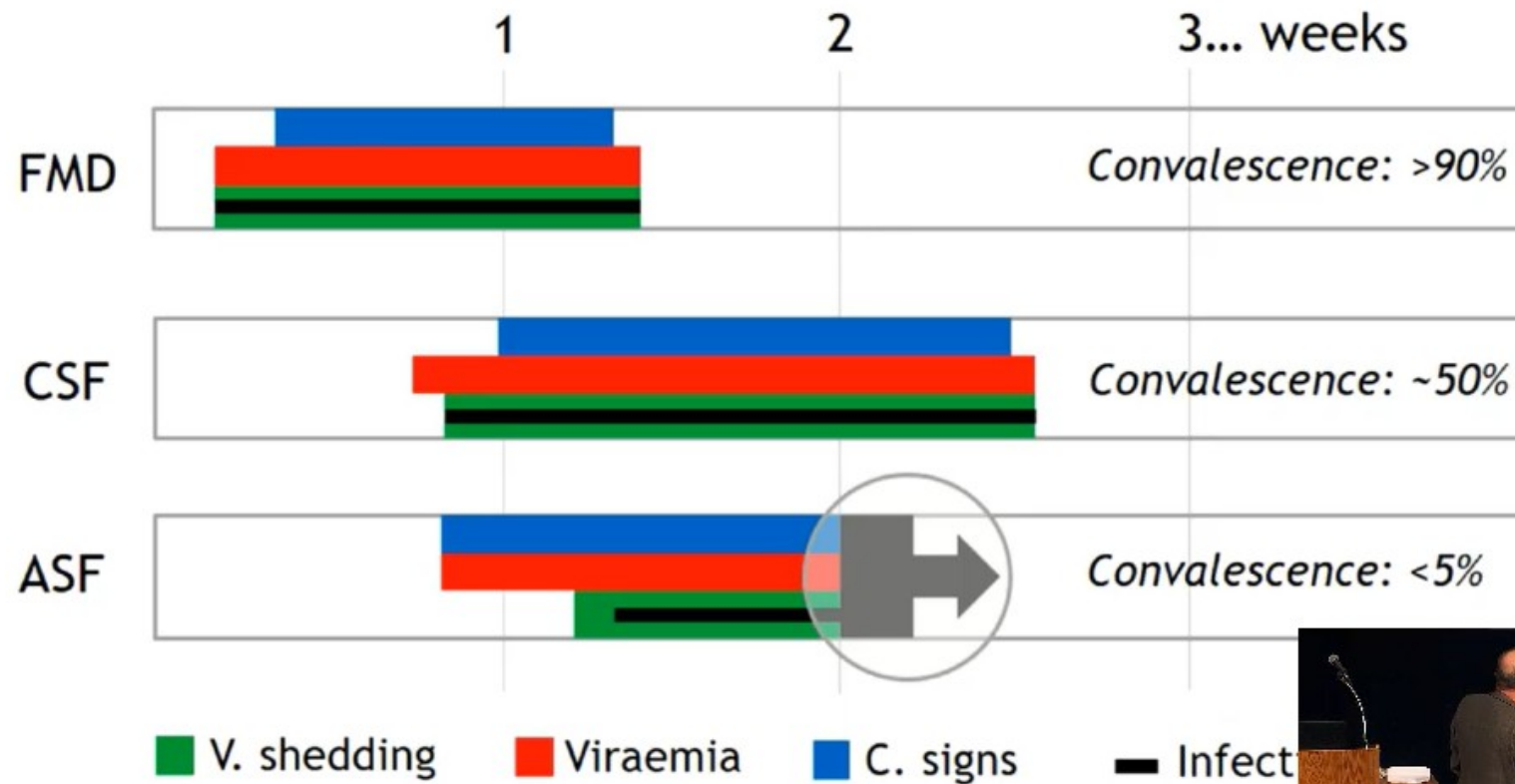




# 非洲猪瘟 - 古典猪瘟 - 口蹄疫



# ASF - CSF - FMD



# Virus dose & contagiousity

Inoculated	Dose	Infected	Index
12 x ASPV Armenia	25 HAU	1	0,08 (1)
12 x ASPV Armenia	3 HAU	1	0,08 (1)
6 x ASPV Armenia	1000 HAU	0	0 (0)
30 x ASPV NL 1986	20.000 HAU	20	0,66 (1)
10 x ASPV Estland	100.000 HAU	9	0,9 (1)
5 x ASPV Estland	100.000 HAU	4	0,8 (1)

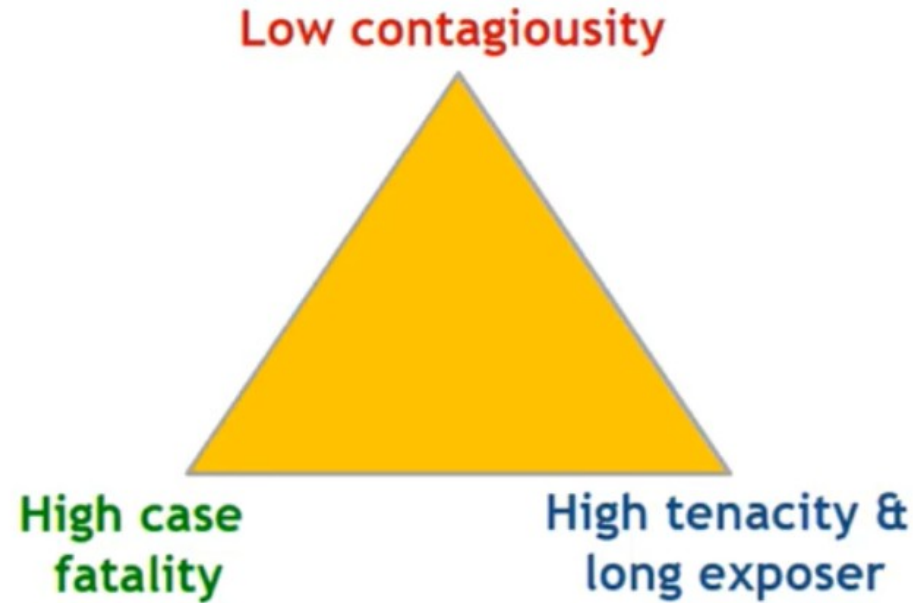
(Beer and Blome, FLI-IVD)

**8% - 90%**





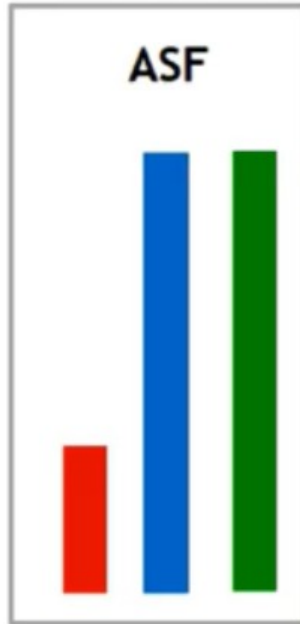
# Persistency triangle (ASF)



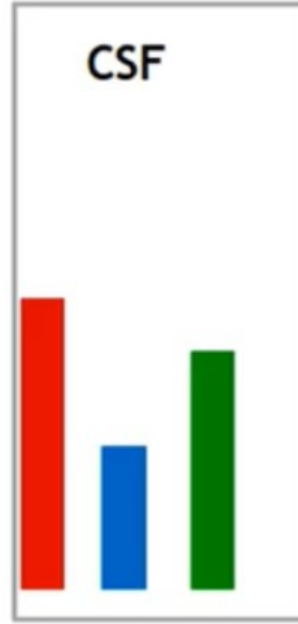
**Low contagiousity:** only few animals get infected  
**High case fatality:** very few survivors & insufficient immunological p  
**High tenacity:** long time survival of virus in the environment, long ex



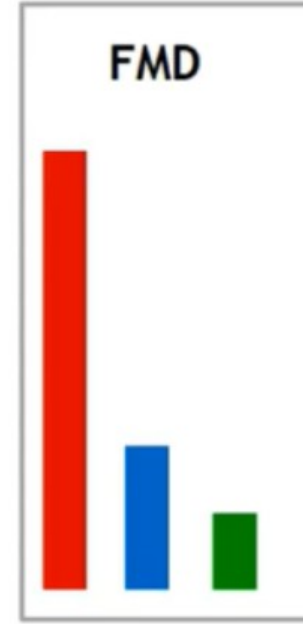
# Summary



Endemic situation,  
slow spread,  
does not fade out



Fades out after  
reducing  
susceptibles by  
vaccination



Fades out  
spontaneously

Contagiousness  
Tenacity  
Case fatality

*Two of three parameters should be low/medium for the epidemic*



- ASF is in the field not a highly contagious disease
- ASF in WB is a habitat disease
- ASF is a “slow” disease
  - ASF did not fade out: **NO implosion**
  - ASF did not spread rapidly (Rabies-like...) **NO explosion**
  - Lethality high (>90%)
  - Starting mortality low (<5%)
  - Prevalence low (<5%)
  - Not necessarily a density dependent process

**Endemic in the region, slow spread**

It changed the understand





## Passive surveillance for DP and WB

*5/95 surveillance concept is not  
purposeful*

**Active surveillance gives a false sense of security**



## Early detection of ASF in wild boar

*Passive surveillance vs. active surveillance*

	tested	positive	% <i>positive</i>
<i>Passive</i> (found dead)	245	177	<b>72.24</b>
<i>Active</i> (hunted)	2765	40	<b>1.45</b>
		217	

**Passive / Active: 72.24 / 1.45 = 49,82**

*The probability to detect an ASF positive case is  
**50** times higher in dead animals than in hunted animals*

**81 out of 100** positive cases are likely to be detected in **dead** v  
(177 / 217 x 100 = 81)



## 1. The epidemiological enquiry shall aim to:

- a. identify the likely origin of the disease and the means of its spread;
- b. calculate the likely length of time that the disease has been present (**High Risk Period**);
- c. identify establishments and epidemiological units therein, food and feed businesses or animal by-products establishments, or other locations....;
- d. obtain information on the movements of animals, persons, products, vehicles, etc. which could have spread the disease agent during the relevant period preceding the notification (*High Risk Period*);
- e. obtain information on the likely spread of the disease in the surrounding environment, including the presence and distribution of disease



- A) Postulate different hypothesis
- B) Address each hypothesis separately
- C) Exclude hypothesis one by one

## Hypothesis for:

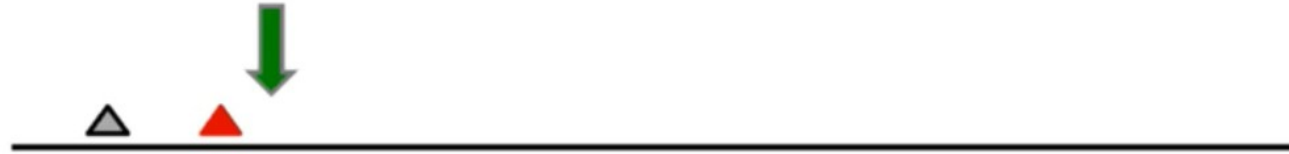
- **Way of entrance**: How (by which ways) did the pathogen entered the holding
  - **Biosecurity check**
- **HRP**: When did the pathogen entered the holding (date of entrance)





## Farm mortality 3%/week

A: 50 pigs  
( $M: < 2$ )



B: 150 pigs  
( $M: < 3$ )

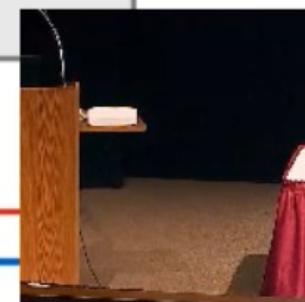
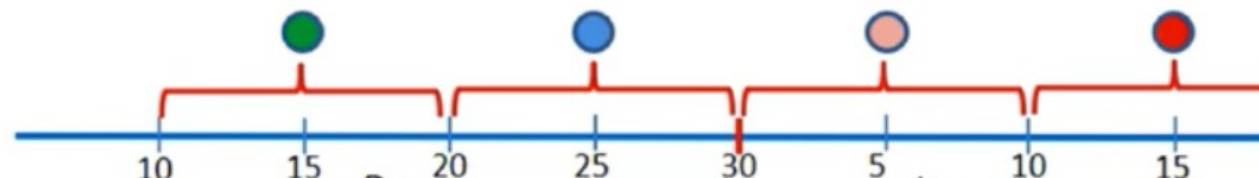
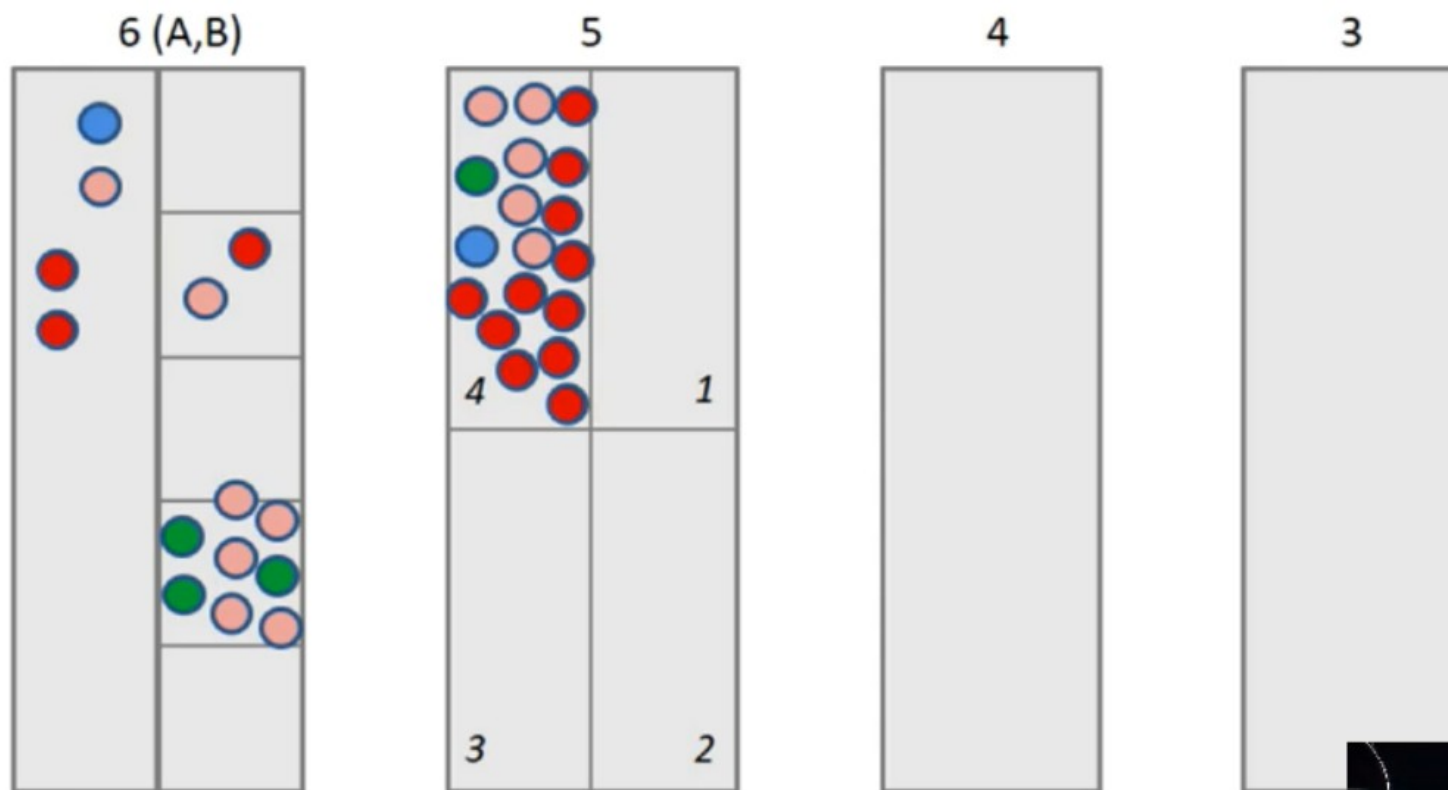


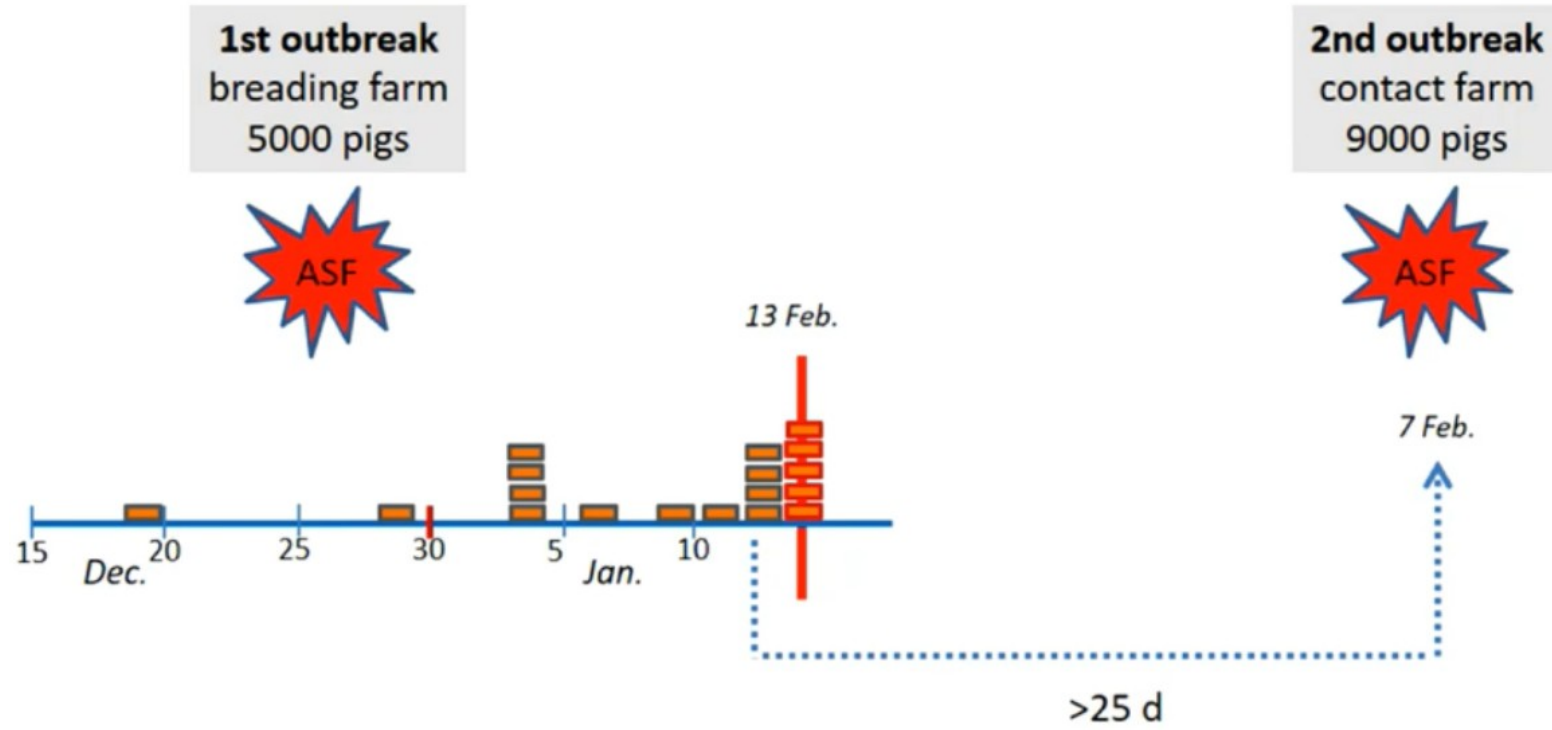
C: 1000 pigs  
( $M: < 30$ )



HRP => size of epidemiological u









# Biosecurity

## the most effective control tool

The only potent tool we have...

- *Africa - double fencing*
- *Three golden rules of biosecurity*



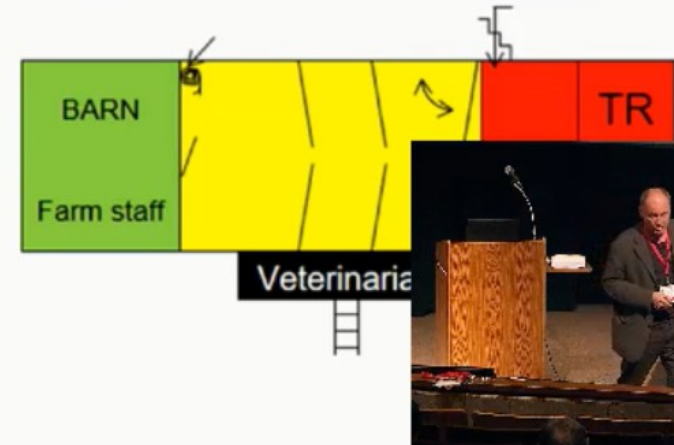
# Biosecurity

## Hardware



J. Westergaard

## Software (Mindset/Philosophy)



**Good news (domestic pigs):** slow spread of the disease

*ASF in domestic pigs can be controlled effectively by good management and biosecurity!!!*

**Bad news (wild boar):** slow spread of the disease

*ASF in wild boar survives locally over months years in wild boar populations (a habitat disease)*



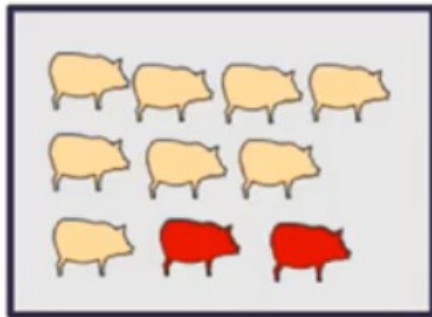


# ASF control and eradication

## Key characteristics of ASF:

- low contagiousity, slow spread, few secondary infections
- no transmission by wind or insects,
- **site fidelity** (stable disease / habitat disease),

### DP: stable disease

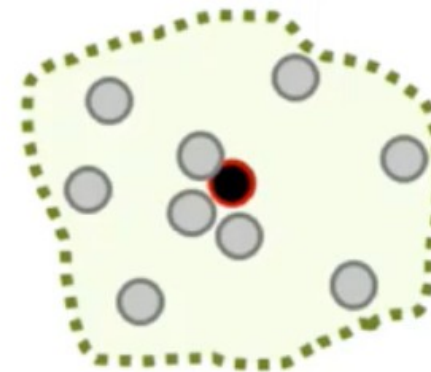


#### Measures:

1. Standstill
2. Culling
3. C&D

*Successful approach!!*

### WB: habitat disease



#### Measures:

1. Standstill (no disturbance, hunting, electrical fence, etc.)
2. (Trapping)
3. Disposal of carcasses

*"Virtual stable" is*



## Freedom of disease

### Wild boar management measures

*e.g. population reduction to avoid  
agricultural damage*

*e.g. Intensive hunting*

## Presence of disease

### Disease control measures

*not wild boar management  
measures!!!*

Movement restriction  
Ban of feeding  
Prohibition of hunting  
Intensive hunting

Hunting/Slaughtering



Culling





Thank you!

### A special thanks to:

- **Baltic friends** (*Kristine, Edvins, Martins, Marius, Arvo, Imbi...*)
- **Vittorio**
- **Karl and Erika**
- **My colleagues** (*Anja, Klaas, Laura...*)

