

Wieviel sollte man über die ASP wissen,
um vorzubeugen, zu erkennen,
zu bekämpfen?

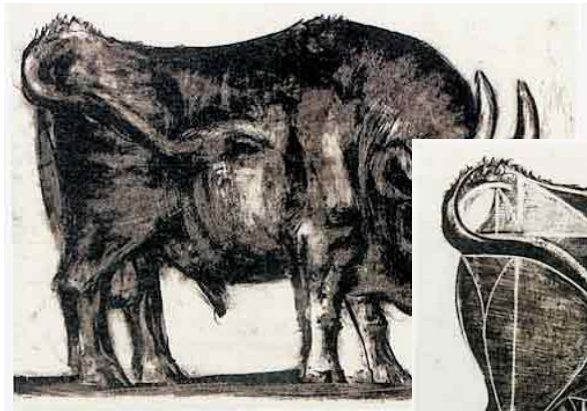
Klaus Depner Institut für Internationale
Tiergesundheit / One Health

April 2021

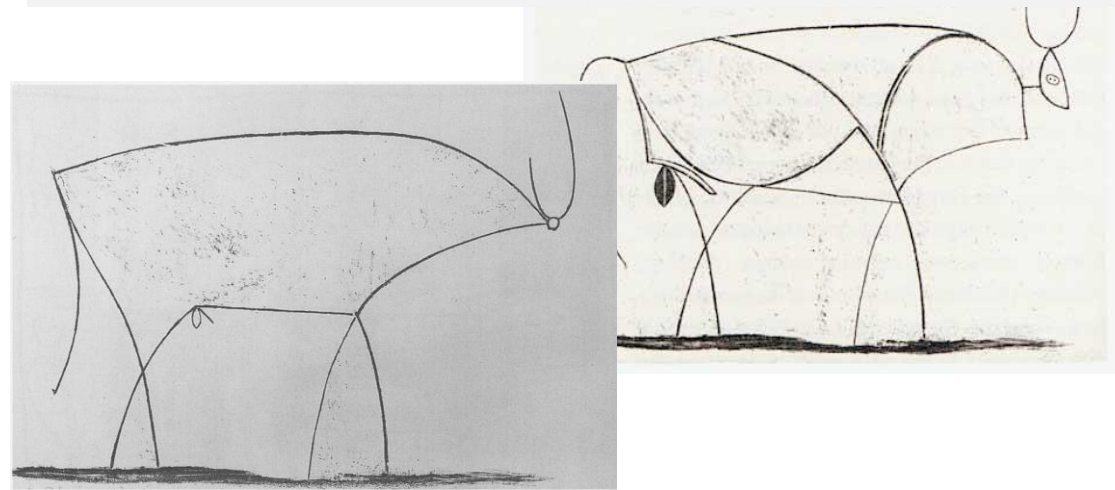
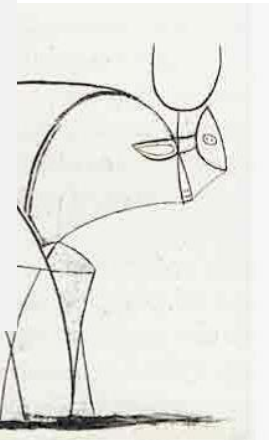
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Federal Research Institute for Animal Health



*...identify the essentials,
spot the disease characteristics
important for epidemiological
understanding...*



Picasso

The preconditions for a strategic approach for outbreak investigations and implementation of measures are based on the biology of ASF

Epi-facts

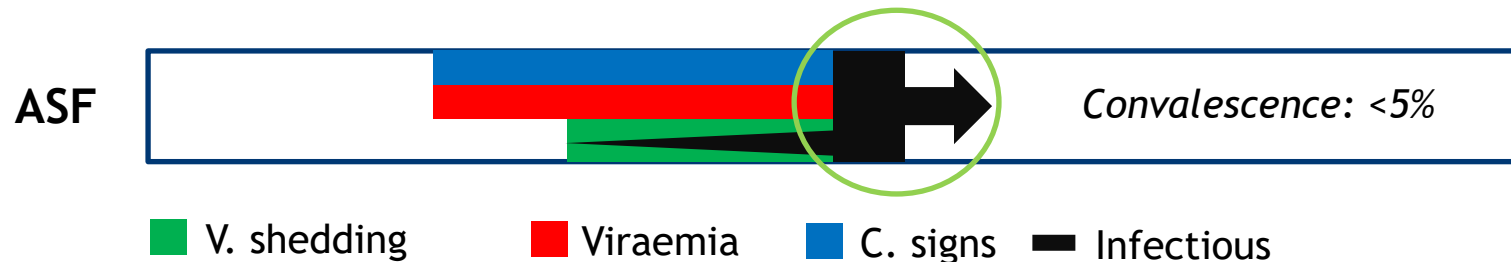
- 1) Tenacity
- 2) Routes of infection
- 3) Susceptibility
- 4) Contagiousity
- 5) Excretion,
- 6) Immunity (individual/heard)
- 7) Clinical course (individual/heard)
- 8) Case fatality, mortality, morbidity
- 9) Latency, persistence, carriers
- 10) Diagnostic information

- 11)

Described by Eustace Montgomery in East Africa (Kenya), 1921

A domestic pig infected with ASFV will in most cases develop a severe haemorrhagic disease ending with death within a couple of days (*Plowright, 1994*)

High case fatality (>90%)



Textbooks say:

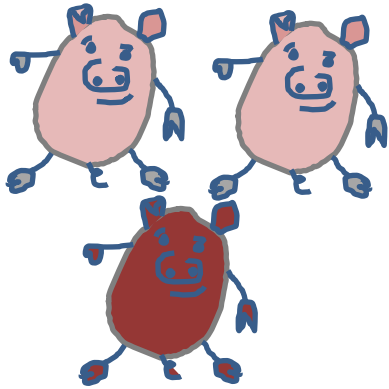
“ASF is a highly contagious haemorrhagic disease of suids...”

-> First crucial mistake in understanding and coping with ASF:

-> ASF is **not** a highly contagious disease

Defining ASF as “*highly contagious*” leads to false expectations and underestimation of the problem

Example: Speed of infection within a herd... rather low contagiousness

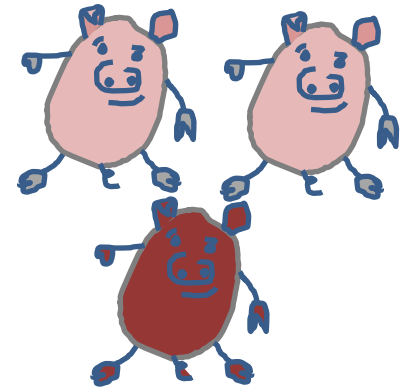


Expectation



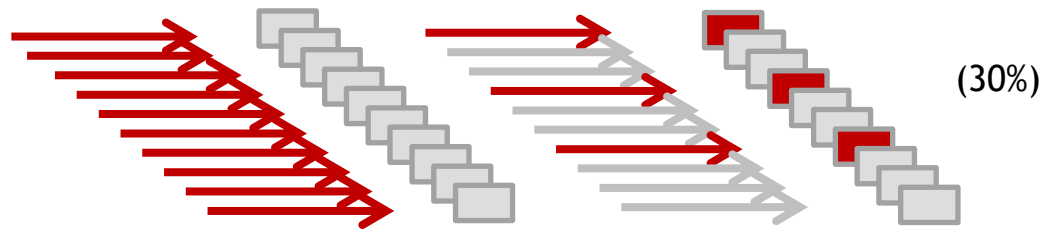
**ASF is an infection which takes its time to spread within a herd,
It can last weeks or months until all
pigs in a large herd get infected.
ASF does not behave like FMD, Influenza or CSF!!!!**

+3d



Contagiousness

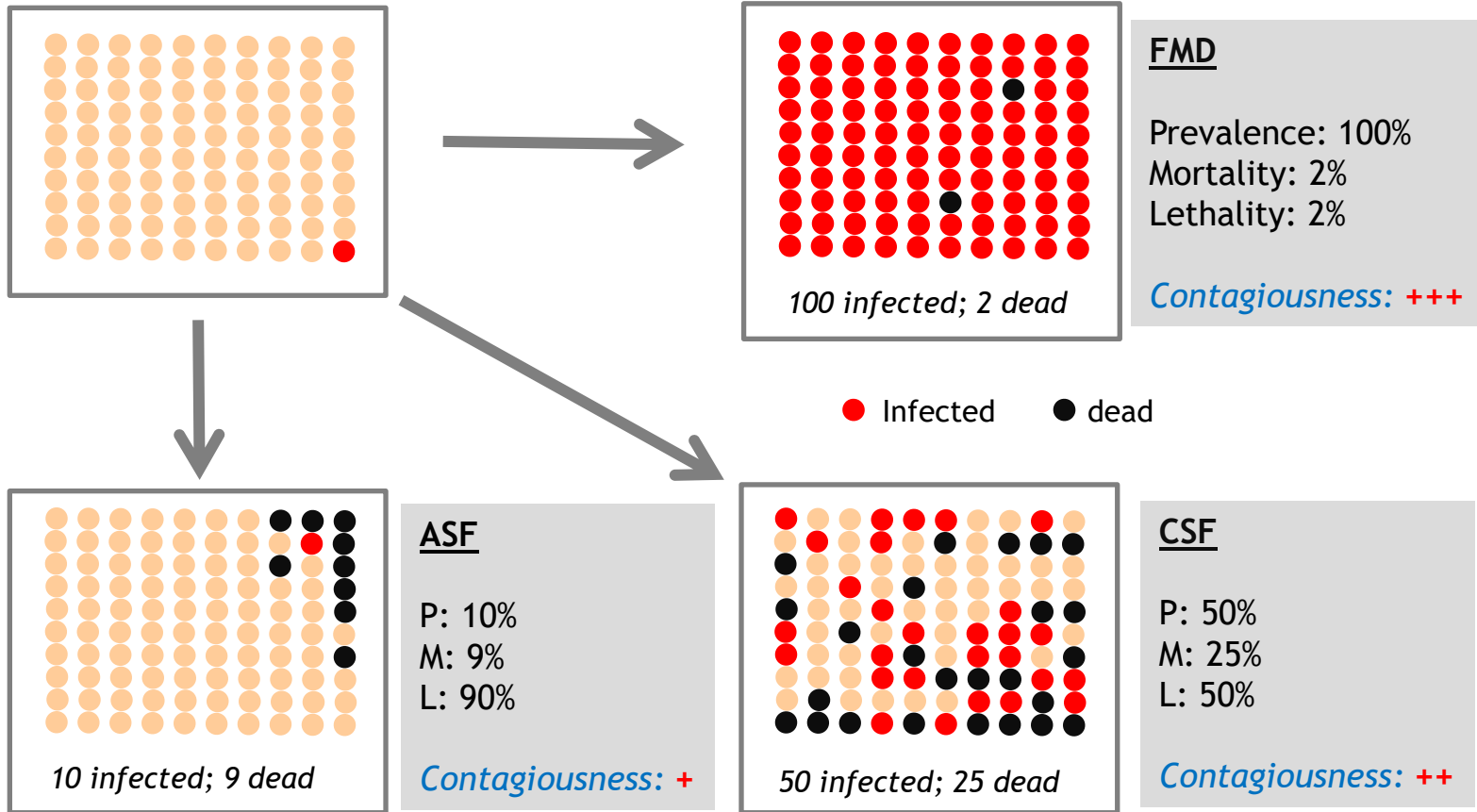
Percentage of animals which get infected after contact with an infectious agent
Probability of infection after contact with a pathogen



It is NOT an indicator for disease severity and impact!!!

- *Low contagious diseases with severe course and high impact*
- *Highly contagious diseases with mild course and low impact*

ASF - CSF - FMD



ASF - CSF - FMD

	ASF	CSF	FMD
Contagiousness	+	++	+++
Virus survival	+++	+	+
Case fatality	+++ (few survivors)	++	+
Initial mortality	+	+++	+
Transmission ways	direct contact (blood)	droplet	droplet
Protective immunity	+	+++	++
Exposer opportunity	+++ (weeks)	+	+

How does a pig get infected?

ONLY by direct contact with infected material (blood) or sick animals

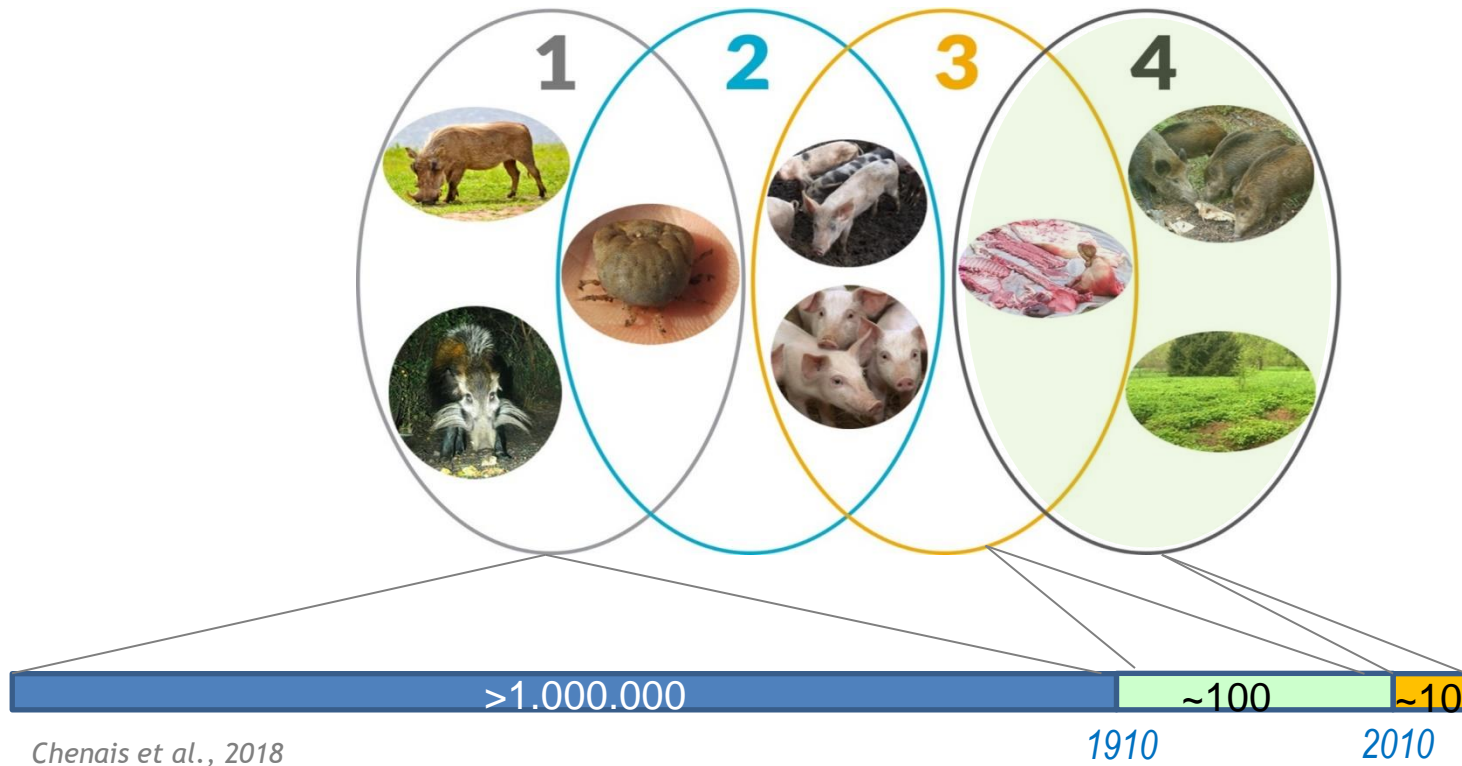
- Feeding on garbage containing infected pig manure or products
- Soft ticks of the genus *Ornithodoros* attached on infected hosts
- Contaminated fomites (e.g., needles, clothes,...)
- Iatrogenic (e.g., needles, instruments...)

**“Blood” is involved in ASF transmission,
direct contact needed**

Infected blood (blood cells) most risky material!!!!

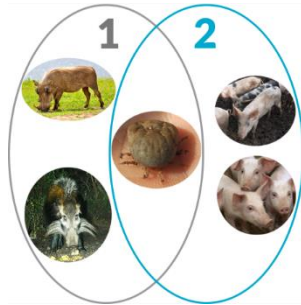
Aerosol infection is unlikely

A short history of ASF



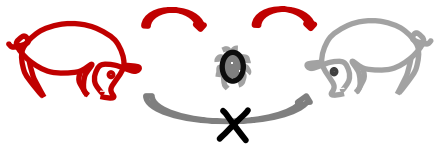
Non-contagious ASF / Contagious ASF

parenteral transmission (*tick bite*)



- Natural (adapted) host:
 - subclinical infection
- Non-adapted host:
 - high case fatality (virulent strains)
 - low case fatality (mild/vaccine strains)

ticks are "overbridging" time



oral infection



- Non-adapted hosts (*sus scrofa*):
 - high case fatality (virulent strains)

habitat is "overbridging" time

Habitat disease



**Do we have evidences that ASF in Eastern Europe
is transmitted by ticks or other vectors?**

No

Which animals can be infected with ASFV?

- Domestic pigs and European wild boars
- All age categories (no age dependency)
- Humans (no infection)

Humans can NOT be infected with ASFV

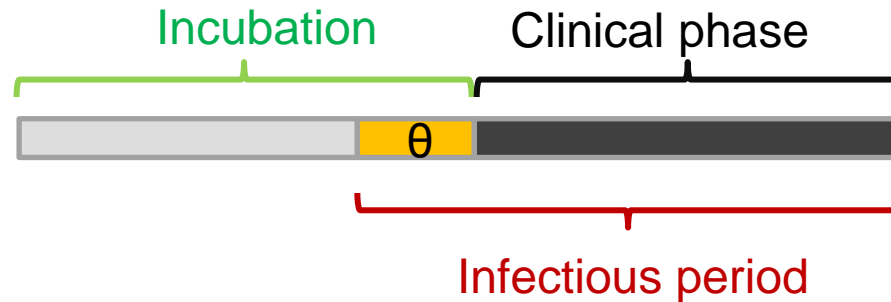
(African wild swine are subclinically infected and act as reservoir hosts for ASFV in Africa)

How long does it usually take from infection until first signs develop?

3 - 15 days (usual incubation period)

(If the infectious dose is high, the incubation period is shorter)

Reactive disease control strategy



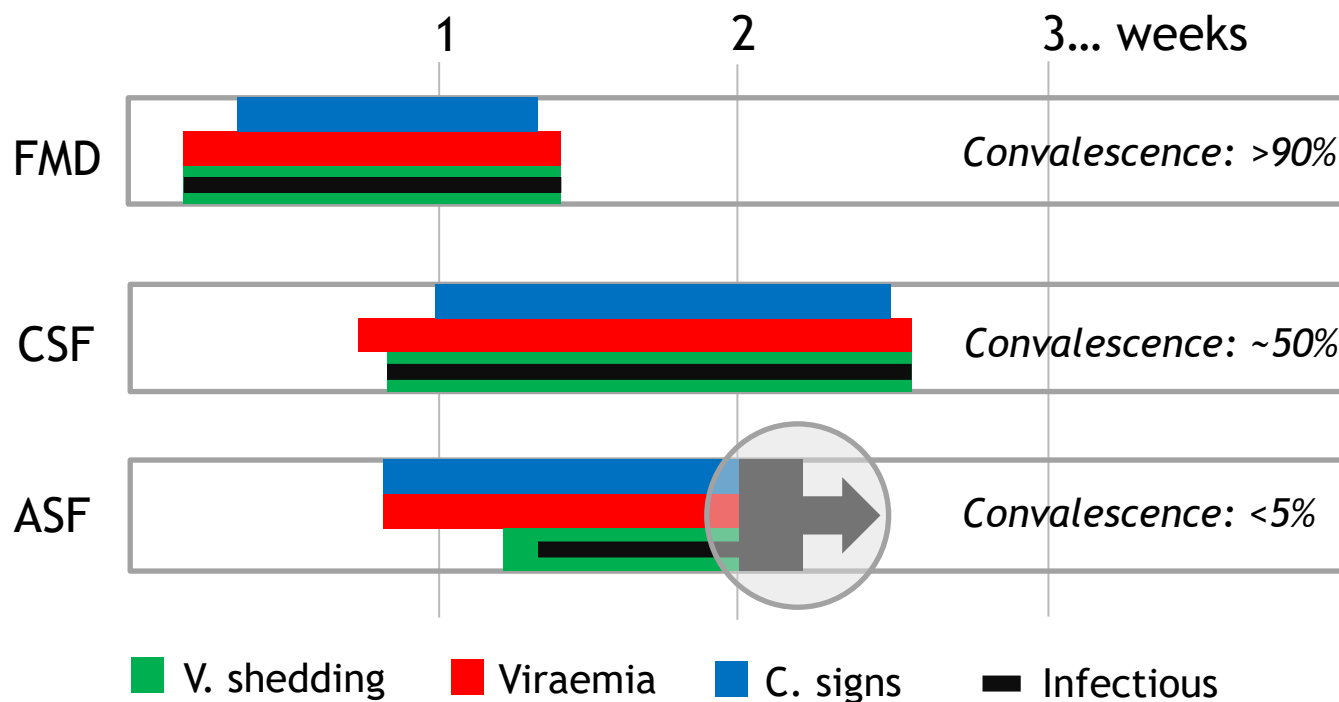
θ : the fraction of transmission that occurs during the **overlap** of the incubation period and infectious period

- *if θ is small, transmission occurs after disease is apparent*
- *if θ is large, transmission occurs also before disease is apparent*

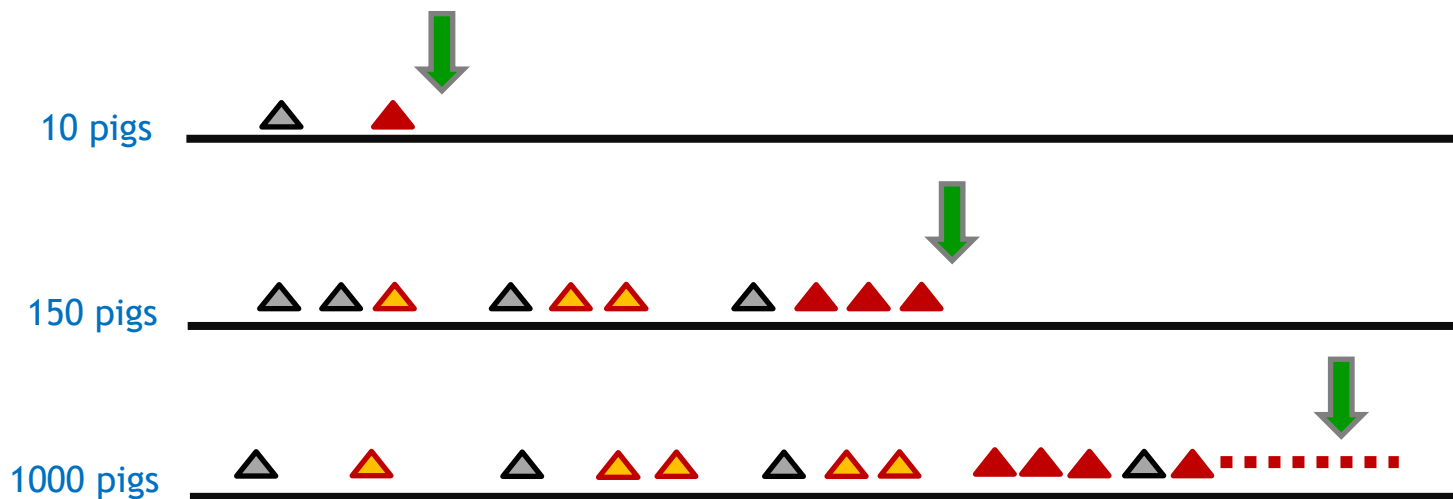
Θ determines the potential for symptom-based animal disease control to reduce the number of infections

The success of reactive disease control strategies is influenced by the fraction of transmission occurring before signs appear

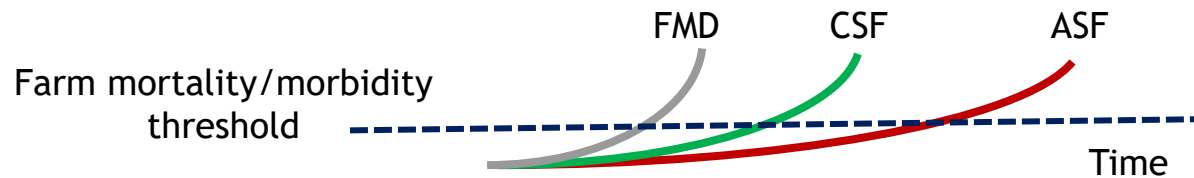
ASF - CSF - FMD



High risk period & farm size



High Risk Period (HRP)



Low contagiousness => low (initial) mortality
ASF remains undetected in large pig farms (below the normal mortality threshold)

HRP -> farm size

- *back yard: rather short*
- *large farm: rather long*

How does ASF look like?

- Sudden death of animals, with few signs
- High fever ($>41^{\circ}\text{C}$)
- Decreased appetite, listlessness, cyanosis and mobility incoordination
- Haemorrhages on the skin
- Vomiting, (bloody) diarrhoea, eye discharges
- Abortion (due to the high fever)

ASF is a haemorrhagic disease.

However, there is not a specific sign that can make you certain that the problem is ASF!!!!

How stable is the ASF virus?

The ASF virus is relatively stable and can persist:

- in pig faeces for several days,
- in carcasses for several months,
- in frozen meat for years.

ASF is a stable virus!!!!

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



How can the ASF virus be destroyed?

The virus is sensitive to dodecyl sulphate and heat (60°C for 30 min), and not so much to putrefaction, formaldehyde

Appropriate disinfectants for ASF:

- 2% caustic soda (sodium hydroxide)
- Detergents
- Sodium hypochlorite (2-3% available chlorine)

*Soiled waste must be removed for burial or destruction before
Disinfection of contaminated material.*

**Depopulated premises should not be restocked
for at least 40 days.**

Du we have good diagnostic tools available to diagnose ASF?

YES, we have good virological tests!
Laboratory diagnosis is not a problem!!!

Test results are used for estimating the HRP

<i>PCR</i>	<i>Ab-Test</i>	<i>duration of infection (estimates)</i>
pos	neg	<12d (or the animal died/sampled before 12d)
pos	pos	>12d (or the animal died/sampled after 12d)
neg	pos	>24d (or the animals was sampled after 24d)

Which samples do I need to send to

- Blood in EDTA (0,5%)
- Organ samples (spleen, liver)
- Bone marrow
- (Serum samples)

**Since ASF is a stable virus
it can be easily detected in nearly all
organs and tissues of viraemic animals**

Are there other diseases that might look like ASF?

Yes, plenty....

Classical Swine Fever (CSF)

Porcine Reproductive and Respiratory Syndrome (PRRS)

Erysipelas

Salmonellosis

Pasteurellosis

Streptococcal

Leptospirosis

Circovirus infection (Porcine Dermatitis and Nephropathy Syndrome - PDNS)

Circovirus infection (Postweaning Multisystemic Wasting Syndrome - PMWS)

Coumarin poisoning

It is essential to send samples to the lab to diagnose ASF!!!

If I am familiar with CSF can I cope with ASF?

No, ASF is not CSF!

Contagiousness, transmission and epidemiology of ASF is different from CSF

ASF is not CSF!!!

When do I consider a case as a suspect

- One or more signs are present
- **One diseased pig is sufficient**
- Diseased animals in high security areas
- Epidemiological surveillance

That it is better to report a suspicious case that ends up being negative, than not reporting!!!

Is there a vaccine or a treatment against ASF available?

There is no vaccine and no treatment (infected/vaccinated animals do not produce antibodies).

The most important measure is biosecurity, for example: wearing protective clothing, make quarantine zones, avoid contact between different groups of animals.

There is no vaccine and no treatment against ASF available!!!
BIOSECURITY is the most important tool

Biosecurity

Hardware

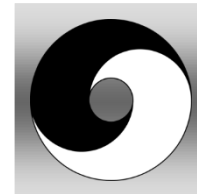


J. Westergaard



Software

(Mindset/Philosophy/Management)





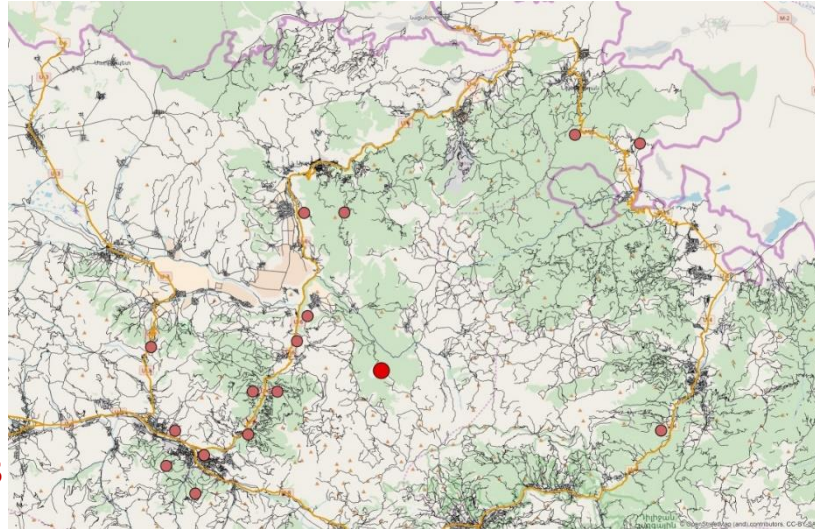
Backyard farming: A biosecurity challenge

Backyard pig farming apart from tradition

- plays an integral role in recycling of food,
- plays an important role for meat supply in rural areas
- is a valuable cash income.



Backyard farming

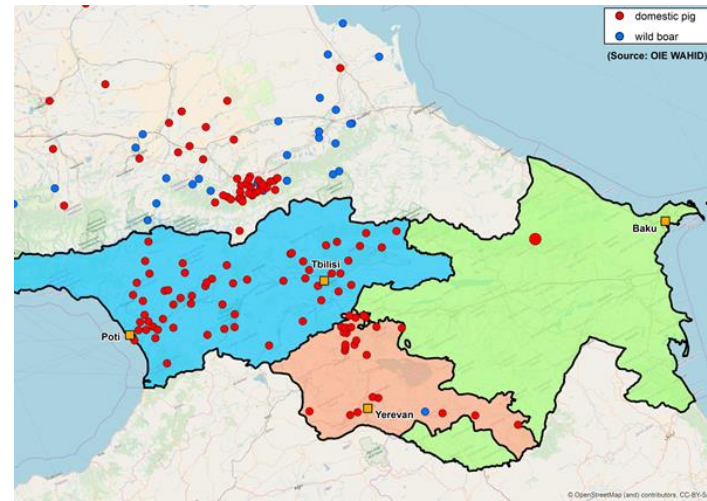


Three basic biosecurity rules

1. No swill feeding
2. No contact between the pig(s) on the farm and susceptible animals
3. The owner/keeper change clothes on entering the stable and leaving the stable

TRADITION

Home slaughtering at Christmas



ProMED-ahead Digest, Vol 102, Issue 50 (22.1.2021):

A new form of ASF identified in Chinese pig farms is most likely caused by illicit vaccines, industry insiders say, a fresh blow to the world's largest pork producer, still recovering from a devastating epidemic of the virus.

...

"I don't know where they come from, but we find some mild field infections caused by some sort of gene-deleted viruses," Yan said.

The future of backyard farming in China

“Thus, the backyard and semi-formal sectors are finished in China, and pig production from this sector will be insignificant probably as early as 2025.”

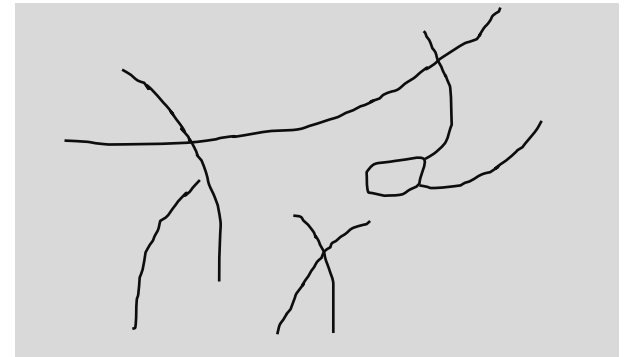
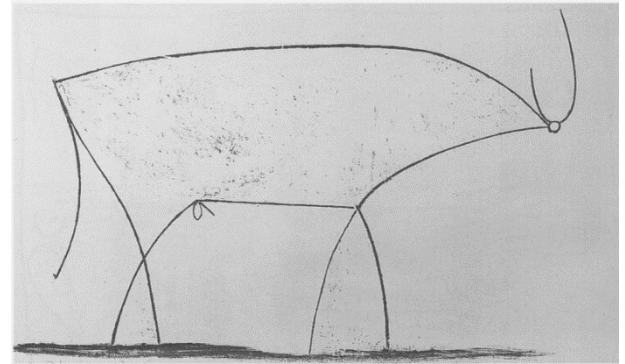
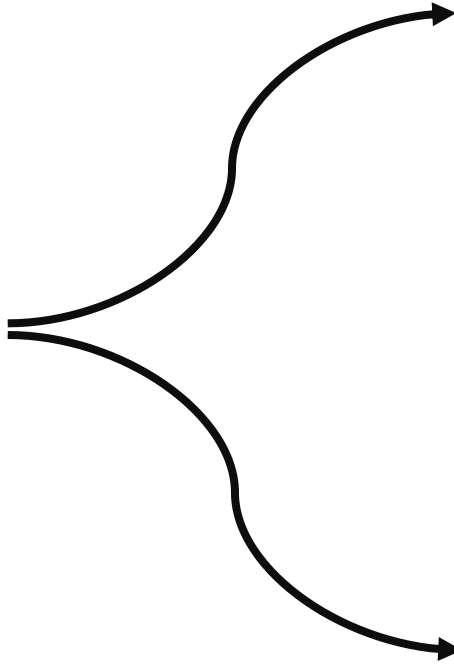
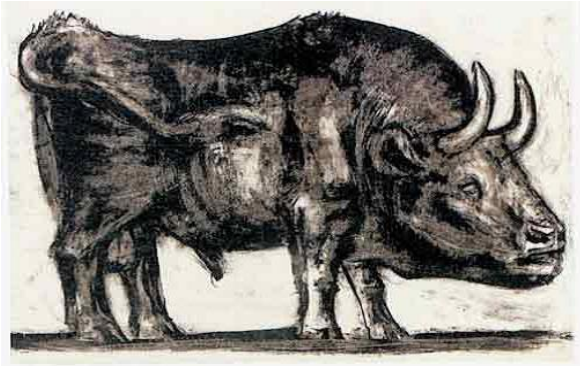


Source: Pig Progress, Foto Henk Riswick

Which are the measures to control ASF?

- Early detection and reporting
- Strict quarantine measures (stand still)
- Stamping out

- **BIOSECURITY**



Vielen Dank für die Aufmerksamkeit!