Klaas Dietze

Friedrich-Loeffler-Institut

Head of Office for International Relations

African swine fever:

Introduction and aspects on early detection

Early detection, sampling and immediate measures to be taken on suspicion/confirmation

WORLD ORGANISATION FOR ANIMAL HEALTH   *Protecting animals, preserving our future*

To complete the picture

http://www.oie.int/en/animal-health-in-the-world/animal-diseases/african-swine-fever/

http://www.fao.org/ag/againfo/programmes/en/empres/ASF/index.html

Brief Introduction to ASF

What are we talking about?

<u>African swine fever</u> (ASF) causative agent:

- African swine fever virus (ASFV) is a DNA virus in the Asfarviridae Family
- Viral genotypes have been identified by sequence analysis.
- Virulence of ASFV isolates vary greatly.
- It is the only known DNA arbovirus.

OIE, technical disease card

Host species

- All varieties of Sus scrofa (domestic and wild) are susceptible to the pathogenic effects of ASFV

- African wild suid species: warthogs, bush pigs, giant forest hogs are usually inapparently infected and act as reservoir hosts of ASFV

- Ticks of the genus Ornithodoros are the only known natural arthropod hosts of the virus and act as reservoirs and biological vectors

OIE, technical disease card

Epidemiological cycles
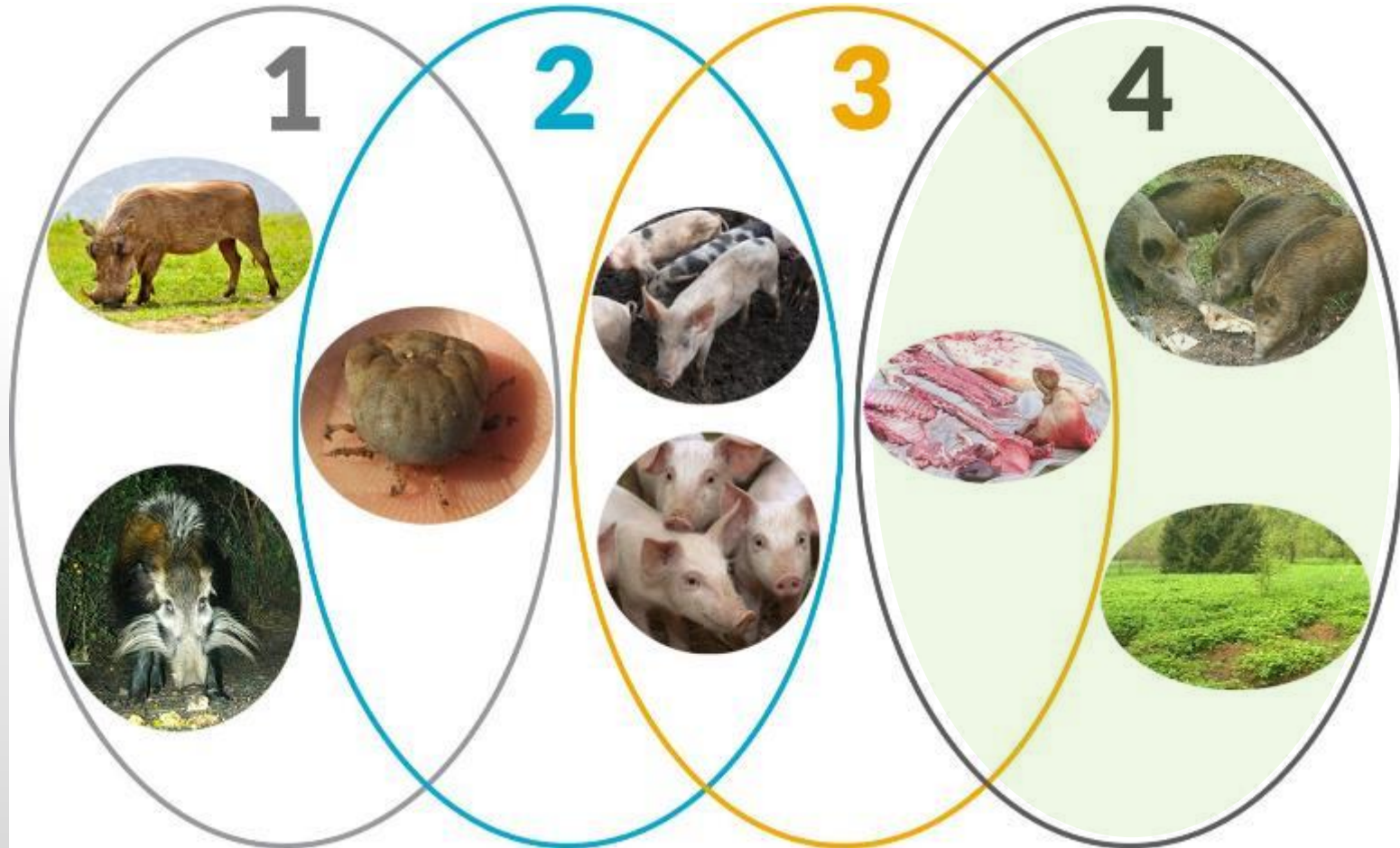
Chenais et al., 2018

Complex spread patterns

Figure 6. Transmission cycles of African swine fever in the Russian Federation involving low biosecurity pig production systems and wild boar.

Solid arrows indicate the main transmission routes as revealed by epidemiological investigations.
Dotted arrows are suspected transmission pathways.
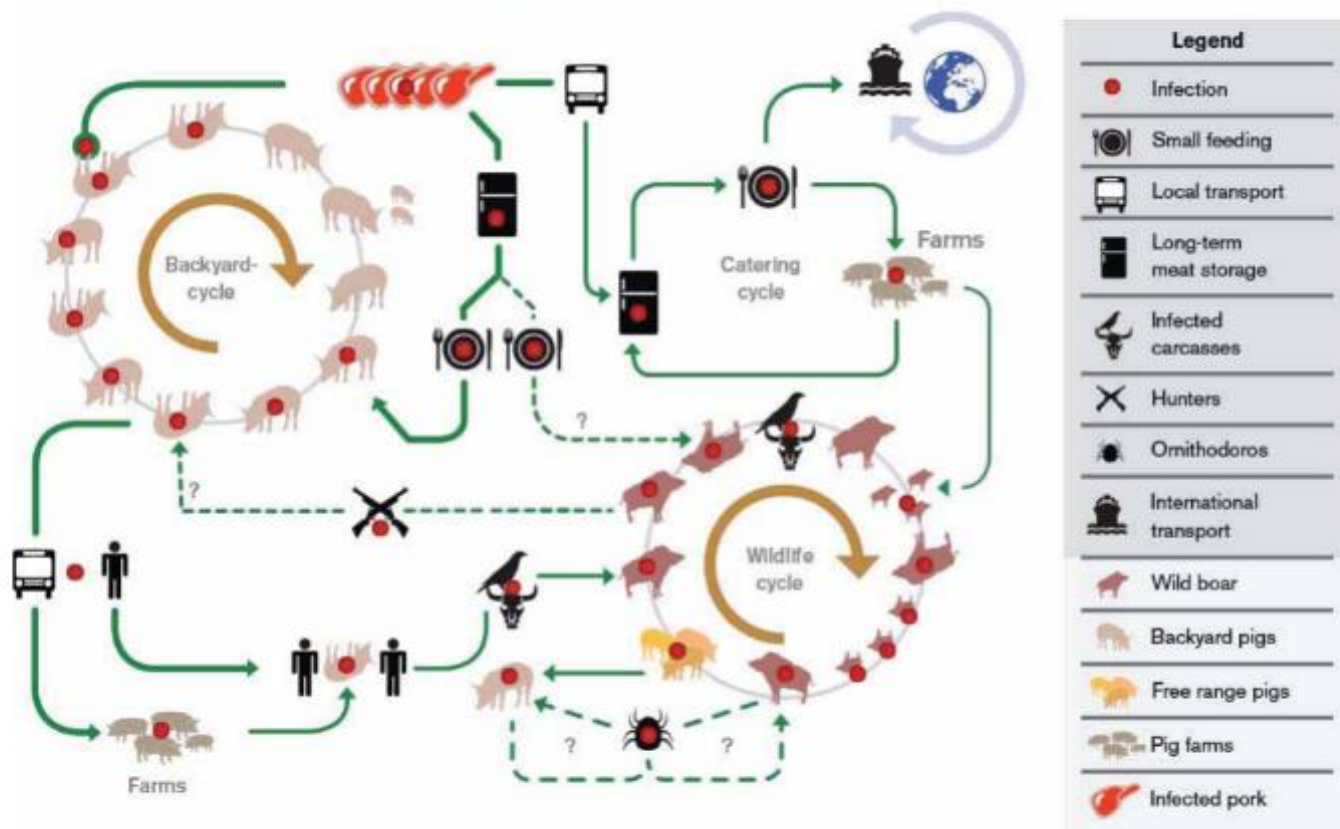
FAO, 2013

ASF at the animal level

©FLI

Once an animal becomes infected…

Current strain circulating in Europe and Asia!

- Case fatality often approaching 100% in domestic pigs and wild boar
- Peracute and acute form most common
- Peracute
  - Sudden death
  - Few unspecific clinical signs

*OIE, technical disease card*

ASF at the animal level

Acute form (highly virulent virus)

- Fever (40.5–42°C)
- Reddening of the skin (white pigs) – tips of ears, tail, distal extremities, ventral aspects of chest and abdomen
- Anorexia, listlessness, cyanosis and incoordination within 24–48 hours before death
- Increased pulse and respiratory rate
- Vomiting, diarrhea (sometimes bloody) and eye discharges may occur
- Death within 6–13 days, or up to 20 days
- Abortion may occur in pregnant sow

OIE, technical disease card

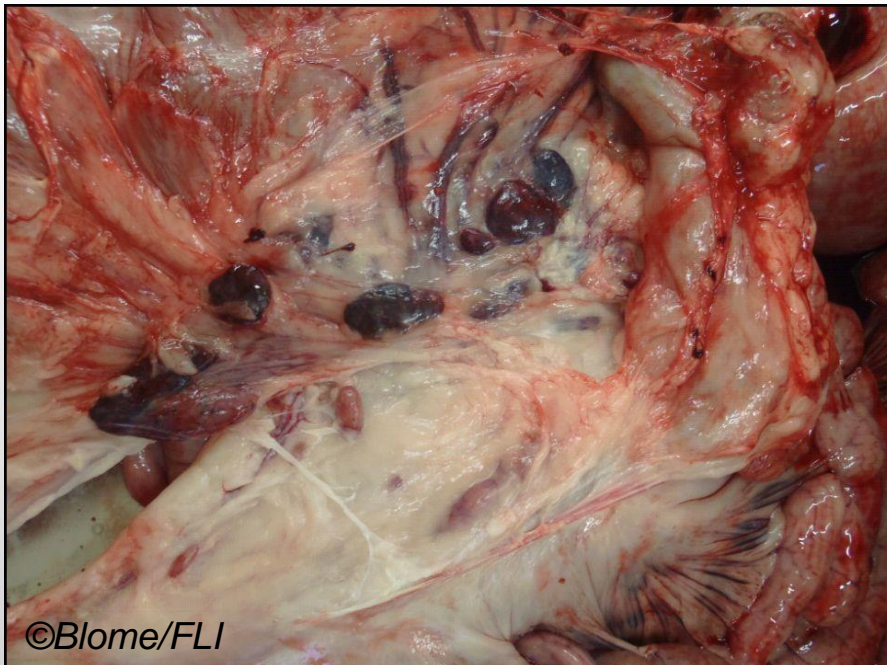# Pathology / Leasions

Congestive splenomegaly

©Blome/FLI

©Blome/FLI
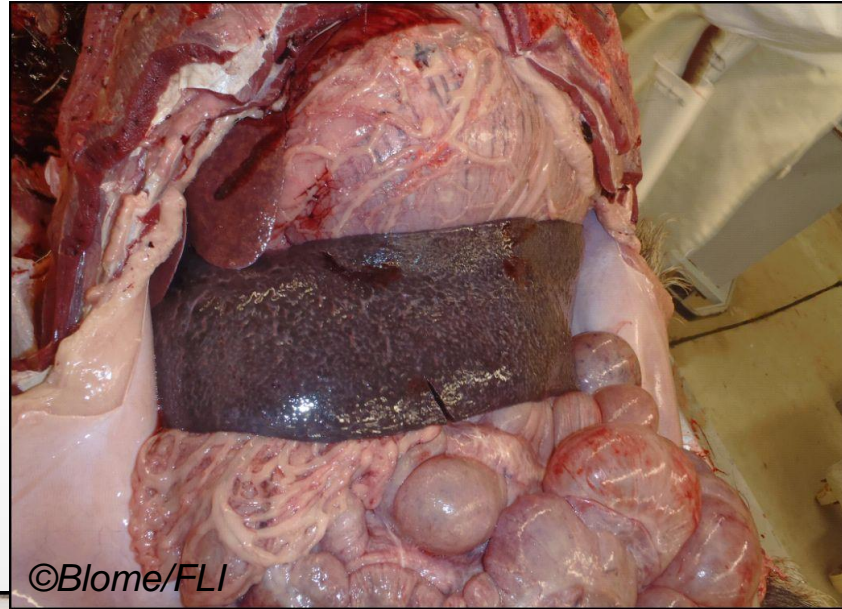
Pathology / Leasions

Petechial haemorrhages
of the renal cortex

©Blome/FLI

©Blome/FLI

oie

Pathology / Leasions

Pronounced haemorrhages in the gastrohepatic and renal lymph nodes

©Blome/FLI

©Blome/FLI

At Herd or Population Level

What we see depends on important factors like:

- When did the initial introduction occur

- How many animals were initially infected

- How much direct or indirect contact happens between animals within a pen / stable / production unit / population

Domestic pig herds

©Zani/FLI

Massive clinical signs in entire group (incl. some very typical signs)

©Zani/FLI

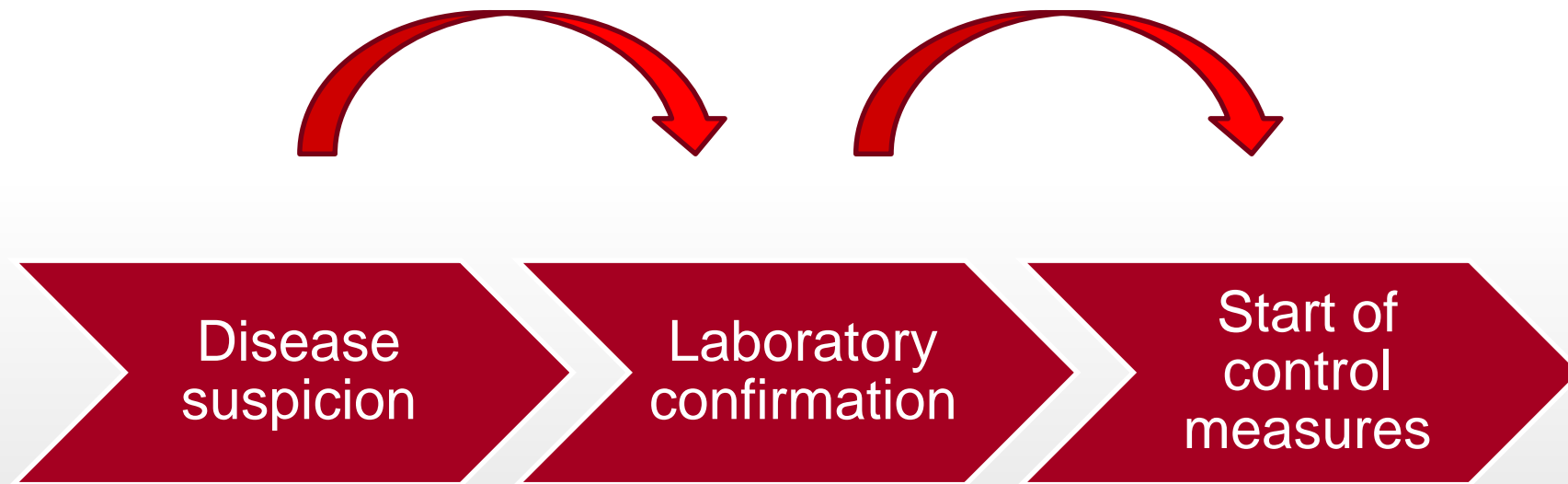Only selected animals with signs of illness (maybe even very unspecific)

Wild boar populations

©Lamberga

Signs of mass mortality or unusual events in wild boar

©FLI/Depner

Often unnoticed, sick wild boar tend to hide

What are the bottlenecks?

Disease suspicion → Laboratory confirmation → Start of control measures

Early detection

From suspicion to confirmation in a timely manner

Disease suspicion → Laboratory confirmation
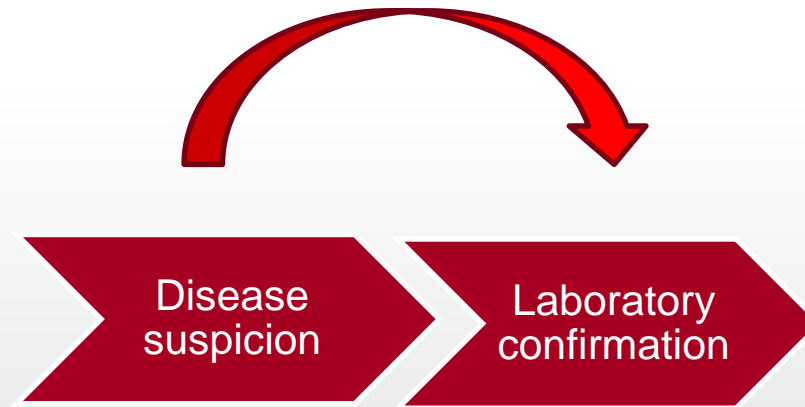
Early detection

Means a system for the timely detection and identification of an incursion or emergence of diseases/infections in a country, zone or compartment. An early detection system should be under the control of the Veterinary Services and should include the following characteristics:

- Representative coverage of target animal populations by field services;
- Ability to undertake effective disease investigation and reporting;
- Access to laboratories capable of diagnosing and differentiating relevant diseases;
- A training programme for veterinarians, veterinary para-professionals, livestock owners/keepers and others involved in handling animals for detecting and reporting unusual animal health incidents;
- the legal obligation of private veterinarians to report to the Veterinary Authority;
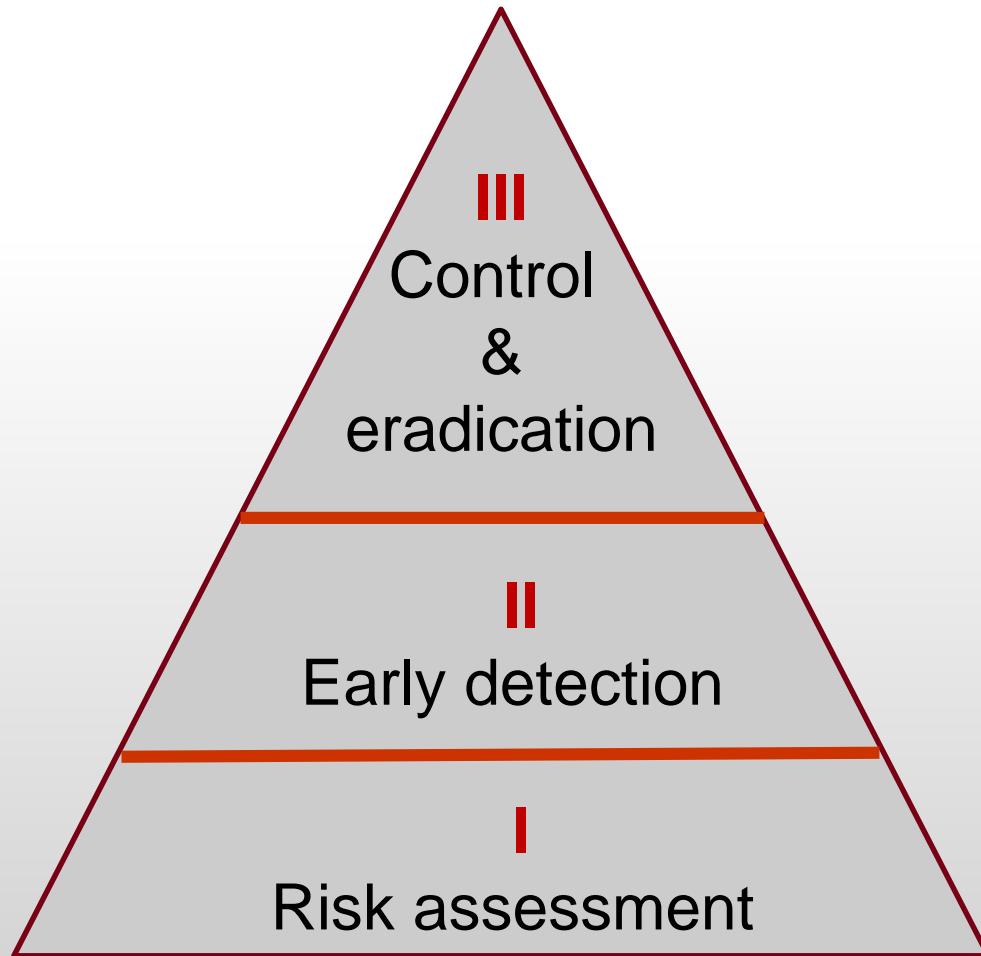- A national chain command.

OIE, Terrestrial code, Glossary

Early detection

Builds on the "preventive measures", in particular:

- Risk Analysis
  - We know where to expect problems / where to look for it
- Contingency Planning
  - We know how we would react once we find it
- Training / Awareness
  - Everybody that needs to know about it, is informed and knows what to do

Disease management

Early detection

From suspicion to confirmation in a timely manner

```
Disease        Laboratory
suspicion      confirmation
```
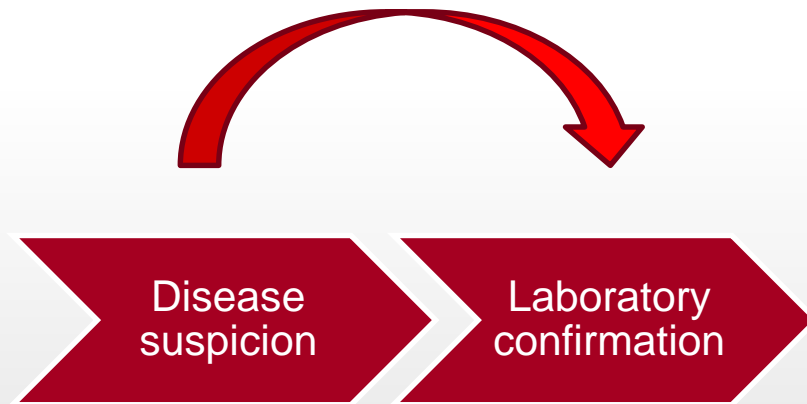
Reducing the
High Risk Period

Identification of "a problem" through surveillance
- passive
- active

Selection of means for confirmation
- clinical
- virological
- serological

Field observations

On larger / commercial farms:
we might not "see" that something is different for several weeks – all within "usual mortality rates". Notification might be late.

On backyard / small household farms:
Once animals start to die, emergency slaughter can occur
Once a total loss occurred no notification might happen at all.

Early detection efforts should address this!

Where to look… if we want to find

Laboratory results for ASF of hunted and found dead wild boar (WB) in the infected regions of Latvia in 2014[a].

Regions	Area size (infected counties)	Estimated WB density	Hunted WB	WB found dead	Cases
	km²	(animals/km²)	(PCR+) Prevalence	(PCR+) Prevalence	
Latgale-North	4166	2000 (0,5)	973 (2) 0,2%	10 (7) 70%	9
Latgale-South	2974	1800 (0,6)	838 (24) 2,9%	89 (60) 67,4%	84
Madona	2962	2000 (0,7)	290 (0)	24 (13) 54%	13
Vidzeme	2807	2000 (0,7)	666 (15) 2,3%	122 (95) 88%	110
Total	12,909	7800 (0,6)	2765 (41) 1,5%	245 (175) 71,4%	216

[a] One ASF case from the Alūksne region which is linked epidemiologically and geographically with cases in south Estonia is not included in this table.

E. Oļševskis et al. / Research in Veterinary Science 105 (2016) 28–30

In a nutshell

If we want to detect ASF <u>early</u>:
- Look for <u>diseased or dead animals</u>
- Conduct laboratory tests looking for <u>viral genome</u>

In domestic pigs this means:
- Enhanced passive surveillance
- Reporting incentives
- In larger farms routine testing of dead animals

In wild boar / feral pig populations
- Increase efforts to find dead wild boar
  - Incentives for hunters but also other people with knowledge and exposure to WB habitat

ASF is always a Team-Task:

Prof. Mettenleiter
Prof. Conraths
Prof. Beer
PD Dr. Blome
Dr. Depner
Dr. Zani
Dr. Sauter-Louis
Dr. Staubach
Dr. Probst
Dr. Schulz
Dr. Globig

klaas.dietze@fli.de
www.fli.de/en/home

FRIEDRICH–LOEFFLER–INSTITUT
FLI
Bundesforschungsinstitut für Tiergesundheit
Federal Research Institute for Animal Health

oie
WORLD ORGANISATION FOR ANIMAL HEALTH
Protecting animals, preserving our future