



# Introduction to ASF

**Vittorio Guberti**

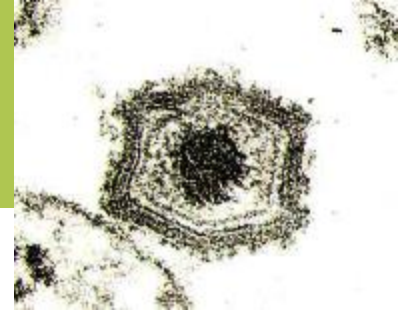
*This presentation is delivered under contract with the Consumers, Health, Agriculture and Food Executive Agency (<http://ec.europa.eu/chafea>). The content of this presentation is the sole responsibility of Opera S.u.r.l., the Istituto Zooprofilattico Sperimentale Lombardia e Emilia Romagna and the State Food and Veterinary Service of Latvia and it can in no way be taken to reflect the views of the Consumers, Health, Agriculture and Food Executive Agency or any other body of the European Union. The Consumers, Health, Agriculture and Food Executive Agency or any other body of the European Union will not be responsible under any circumstances for the contents of communication items prepared by the contractors.*

# BTSEF

**Warsaw, October 2016**

## What we should know for the scope of ASF control/eradication

- The disease (clinical course and clinical signs)
- Mortality/lethality
- Contagiosity
- Tenacity/environmental resistance of the virus
- Ways of transmissions
- Human factors that might affect virus transmission and geographical spread



# ASF virus: large enveloped DNA virus

(genus Asfivirus, family Asfviridae)

**Apparently** strains of different virulence;

16 genotypes (sequence of p72 gene fragment)

**Genotype 1:** West & Central Africa, Europe  
(Sardinia), Caribbean

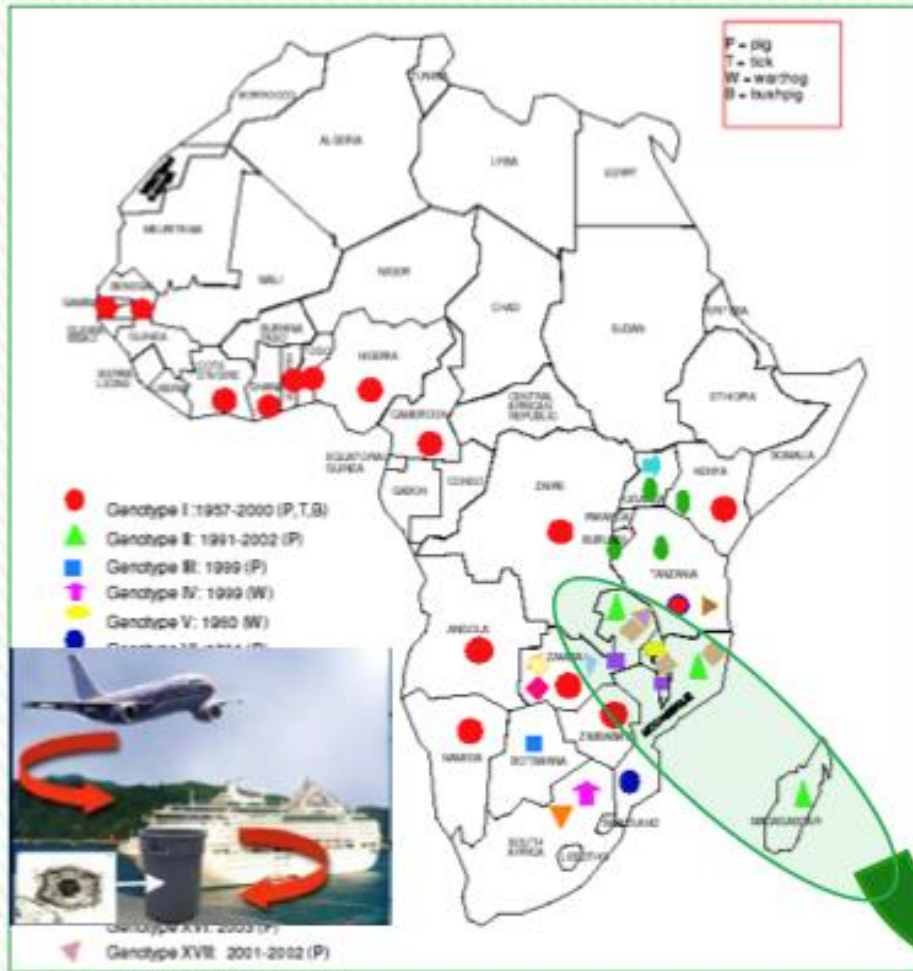
**Genotypes 2 – 16:** East and Southern Africa

ASFV “Georgia”: Genotype 2 (Mozambique,  
Madagascar, Zambia)

One serotype only



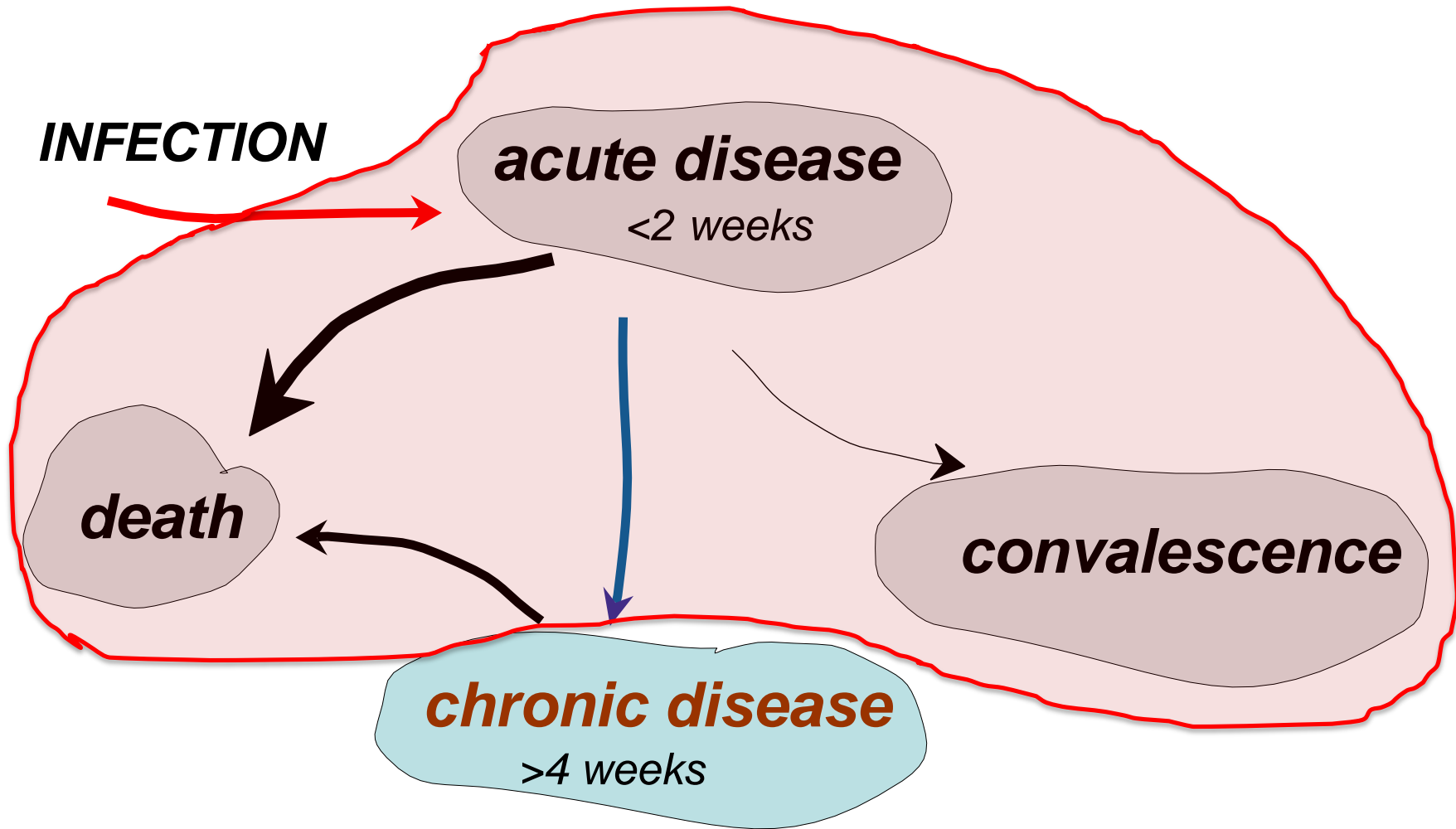
# Tracing the origin



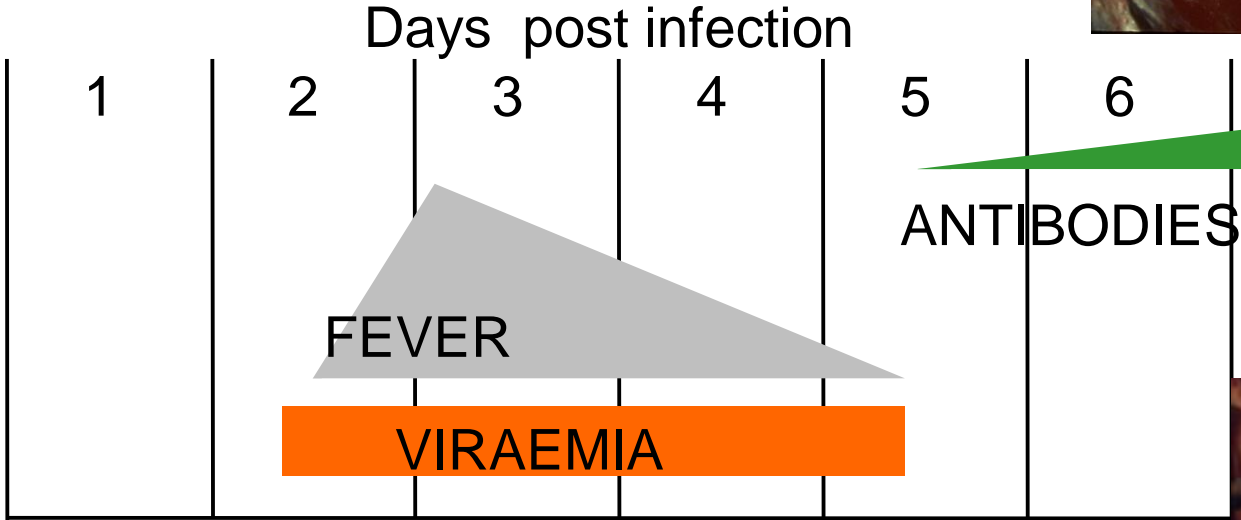
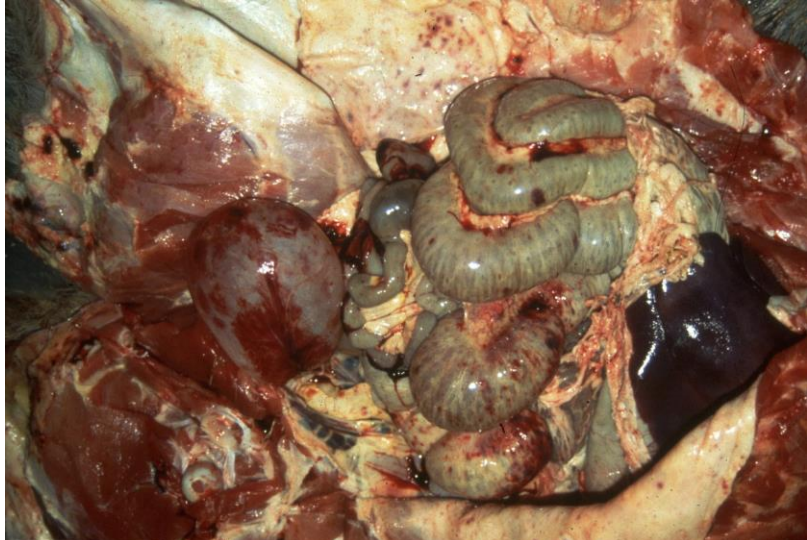
## Georgia June 2007



# Clinical courses of ASF



# Acute course of ASF



Incubation

'typical' symptoms  
mortality up to 100%



## MAIN CLINICAL SIGNS

- 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!!!!***

## East European ASF clinical evolution

- 90-95% of infected animals will **die** in a very short period (3-7 days)
- Very **few** (10-5%) will survive
- Apparently survivors are **not infectious** (do not spread the virus)
- Not yet demonstrated chronic animals
- **Immune-survived animals** can participate again to the infection cycle, but not clear if they eliminate same amount of virus, viremic periods etc.
- Survived animals might harbour the **virus in the lymph nodes** but they are not anymore infectious;
- Virus in lymph nodes could be a problem during **home slaughtering** if not properly managed (should not be allowed)



## Typical findings at the onset of the outbreaks (Eastern Europe)

- Loss of appetite => death
- Fever
- Haemorrhages on the skin
- Death

*Usually 1-2 animals are firstly involved; later the virus will spread to other animals. Only when many animals are infected all the “typical” clinical signs will be observed.*

*In at risk areas..always behave as ASF is in the farm!!!*

## ASF is defined as:

*“a highly contagious haemorrhagic disease of suids...”*

-> from the filed

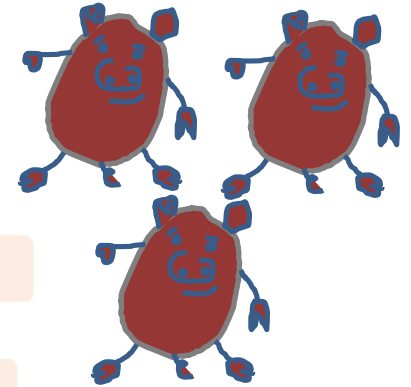
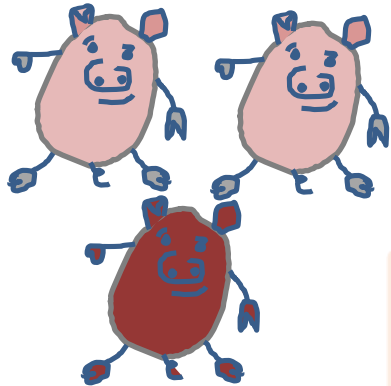
-> ASF is **not** a very highly contagious disease

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

*Example: Speed of infection within a herd... rather a low contagiousity*

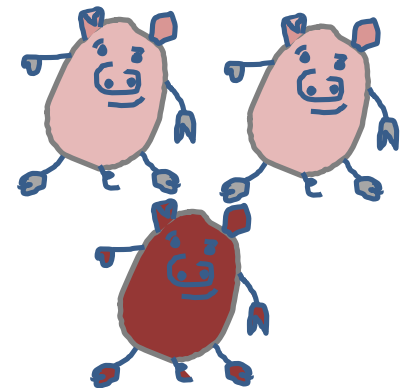
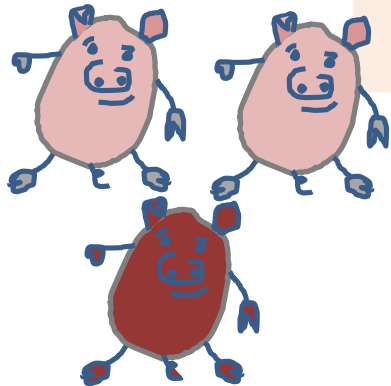


European  
Commission



Expectation

BTSF



+3d

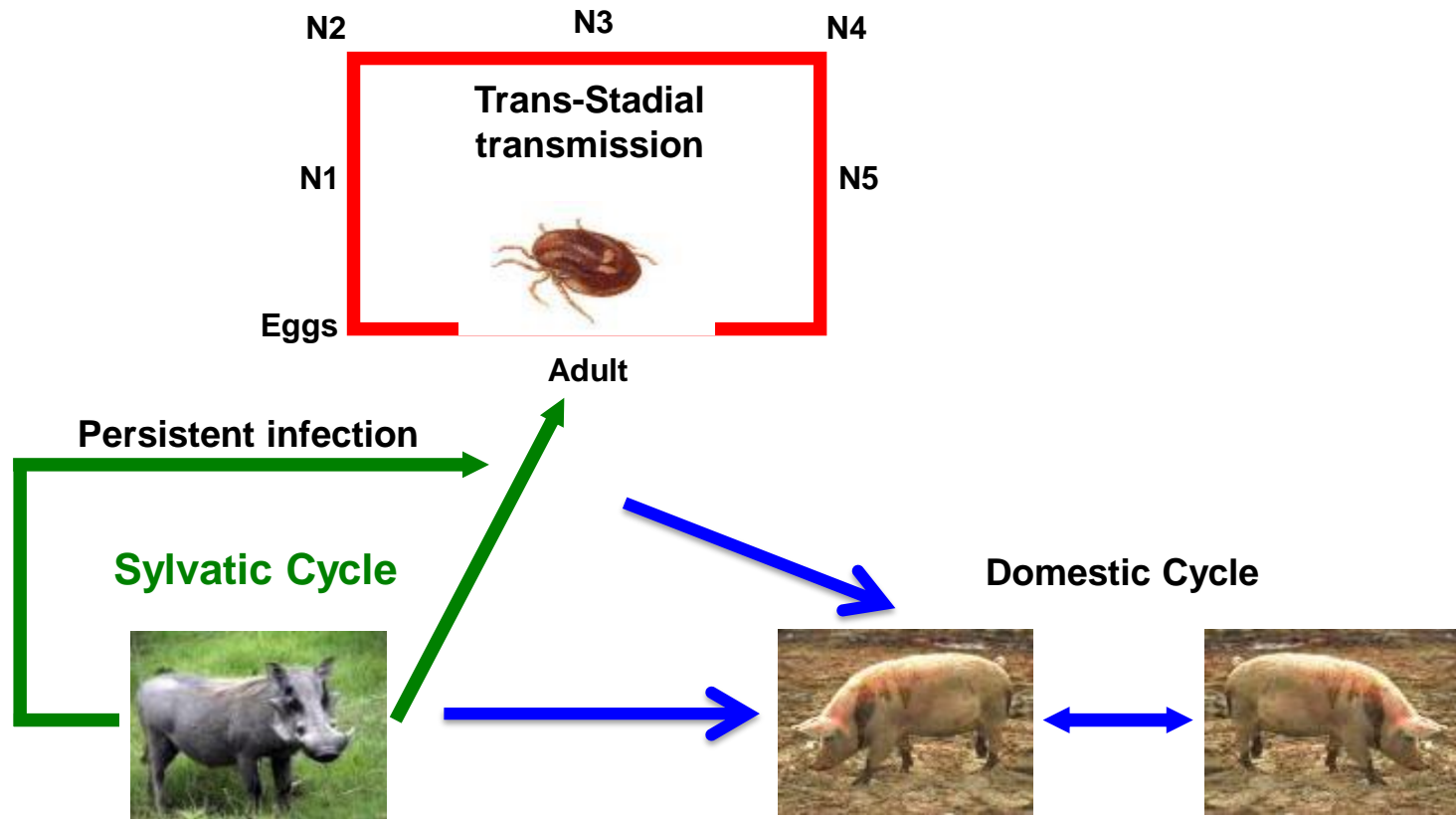
## European susceptible species:

- Domestic pigs and European wild boar
- All age categories (no age dependency)
- Without gender predilection

*(African wild swine – warthog - are unapparently infected and act as reservoir hosts for ASFV in Africa)*

*It is not a zoonosis*

# ASFV Transmission: not in East Europe



*Ornithodoros moubata* (Africa): trans-stadial transmission sexual and trans-ovarian pathway

*Ornithodoros erraticus* (Iberian Peninsula): trans-stadial transmission

## How does a pig get infected?

ONLY by direct contact with infected material or sick animals

- Feeding on garbage containing infected pig meat and/or pork products
- Soft ticks of the genus *Ornithodoros* that previously fed on infected hosts
- Contaminated fomites (premises, vehicles, clothes,...)
- Iatrogenic (needles, syringes, instruments...)

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

*Aerosol infection is unlikely*

## Tenacity of the ASF virus

The ASF virus is stable

The virus evolutionary strategy is to remain alive for long time rather than spread fast

It can persist:

- in pig faeces for **several days**,
- in pork products for **several months**,
- in frozen meat **for years**.

BTSEF



European  
Commission

## ASF VIRUS IS VERY STABLE

**Carcasses: 3 – 5 weeks infectious**



- 140 days in Iberian and Serrano hams
- 399 days in Parma ham
- 112 days in Iberian pork loins.
- 18 months in pig blood at 4°C
- 11 days in faeces at 20°C
- **Stable in carcasses (dead animals) which decompose**

However, no infectious ASFV has been found in cooked or canned hams when processed at 70°C.



## ASF laboratory diagnosis

Virological and serological tests are largely available; ASF diagnosis is not a problem. **MAIN AIM: virus detection with PCR**

Test results can also be used for indicating the duration of infection

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

## Samples needed by the lab for ASF diagnosis

- Blood in EDTA (0,5%) for PCR

**Plus** (diagnostic manual; CD 2003/422/EC)

- **Organ samples (spleen, lymph nodes, tonsil, kidney) PCR**
- *Bone marrow in case of old wild boar carcasses*
- Serum for Abs detection

**BLOOD only could give false negative tests....always test  
ORGANS**

# Differential diagnosis

## Classical Swine Fever (CSF)

### Erysipelas

Porcine Reproductive and Respiratory Syndrome (PRRS)

Salmonellosis

Pasteurellosis

Streptococcal infection

Leptospirosis

Circovirus infection (Porcine Dermatitis and Nephropathy Syndrome – PDNS)

Circovirus infection (Postweaning Multisystemic Wasting Syndrome – PMWS)

Coumarin poisoning

BTSF

## Suspect cases

- Risk of the area;
- One diseased pig is sufficient
- One or more clinical signs are present
- Diseased animals in holdings with low biosecurity
- Epidemiological link

## Treatment against ASF

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

### Biosecurity measures are essential

- Antibody response is specific and long-lasting,
- First antibodies are detected 7-10 days p.i.
- **No neutralizing antibodies are produced**
- No or just partial protection against subsequent infections
- Virus replication continues in the presence of antibodies

## Disinfectants

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

Appropriate disinfectants for ASF:

- 2% caustic soda (sodium hydrate)
- Detergents and phenol substitutes
- Sodium or calcium hypochlorite (2-3% available chlorine)
- Iodine compounds

*Solid waste must be removed for burial or destruction before disinfection of contaminated material.*

## **Take at home message**

- **ASF is an infection which takes its time to spread within a herd;**
- **In high risk areas, even one single animal is worth to be suspected ASF positive;**
- **Direct contact is needed;**
- **ASF is a stable virus, it survives where you do not expect;**
- **Laboratory diagnoses of ASF is essential and technically simple;**
- **There is no vaccine and no treatment are available;**
- **Early detection, prompt stamping out and biosecurity measures are the available weapons for the eradication of the infection;**



This presentation is delivered under contract with the Consumers, Health, Agriculture and Food Executive Agency (<http://ec.europa.eu/chafea>). The content of this presentation is the sole responsibility of Opera S.u.r.l., the Istituto Zooprofilattico Sperimentale Lombardia e Emilia Romagna and the State Food and Veterinary Service of Latvia and it can in no way be taken to reflect the views of the Consumers, Health, Agriculture and Food Executive Agency or any other body of the European Union. The Consumers, Health, Agriculture and Food Executive Agency or any other body of the European Union will not be responsible under any circumstances for the contents of communication items prepared by the contractors.

**Opera Srl**



Viale Parioli 96 - 00197 Roma - Italy  
Tel +39 06 96042652 Tel/Fax +39.06.8080111 / +39 06  
89280678

[btsftraining@btsftraining.com](mailto:btsftraining@btsftraining.com) [www.btsftraining.com](http://www.btsftraining.com);  
[www.opera-italy.it](http://www.opera-italy.it)

© Copyright holder: European Commission (2018)

## **Better Training for Safer Food BTSF**

• *European Commission  
Consumers, Health and Food Executive Agency  
DRB A3/042  
L-2920 Luxembourg*