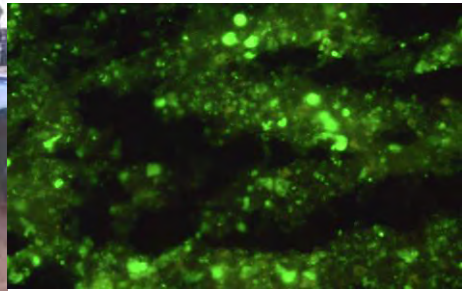
Società Italiana di Medicina Veterinaria Preventiva
Agrigento 10 maggio 2019 - Corso di formazione "Peste suina Africana ed altre patologie da arbovirus"

ISTITUTO ZOOPROFILATTICO SPERIMENTALE DELL'UMBRIA E DELLE MARCHE "TOGO ROSATI"

Peste suina africana: caratteristiche della malattia

Gian Mario De Mia
Centro Referenza Nazionale Pesti Suine, IZS-UM, Perugia (Italy)




Endemica
< 1910 - 2019
1921
Prima conferma
M. Penrith

PSA distribuzione globale

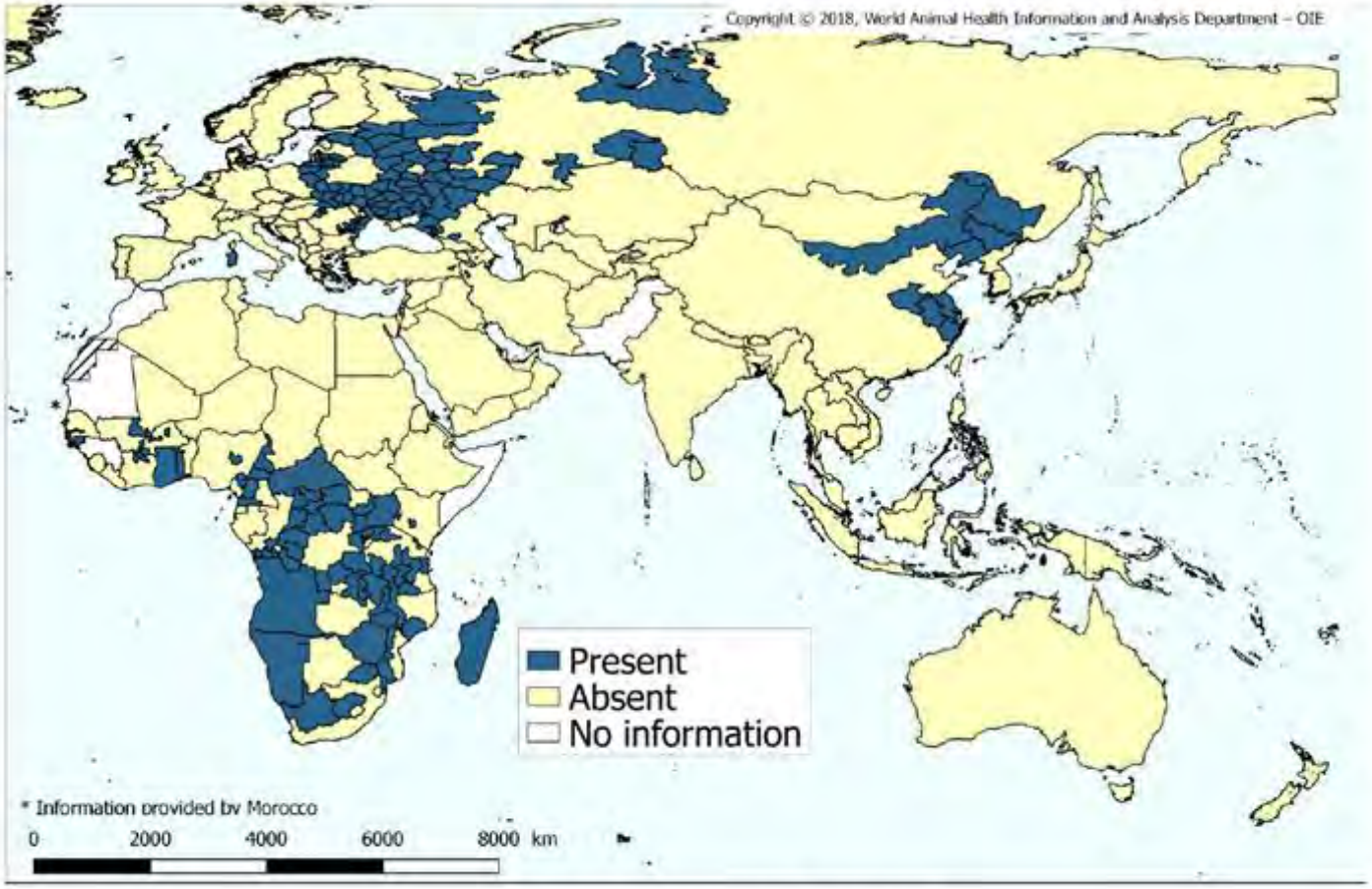
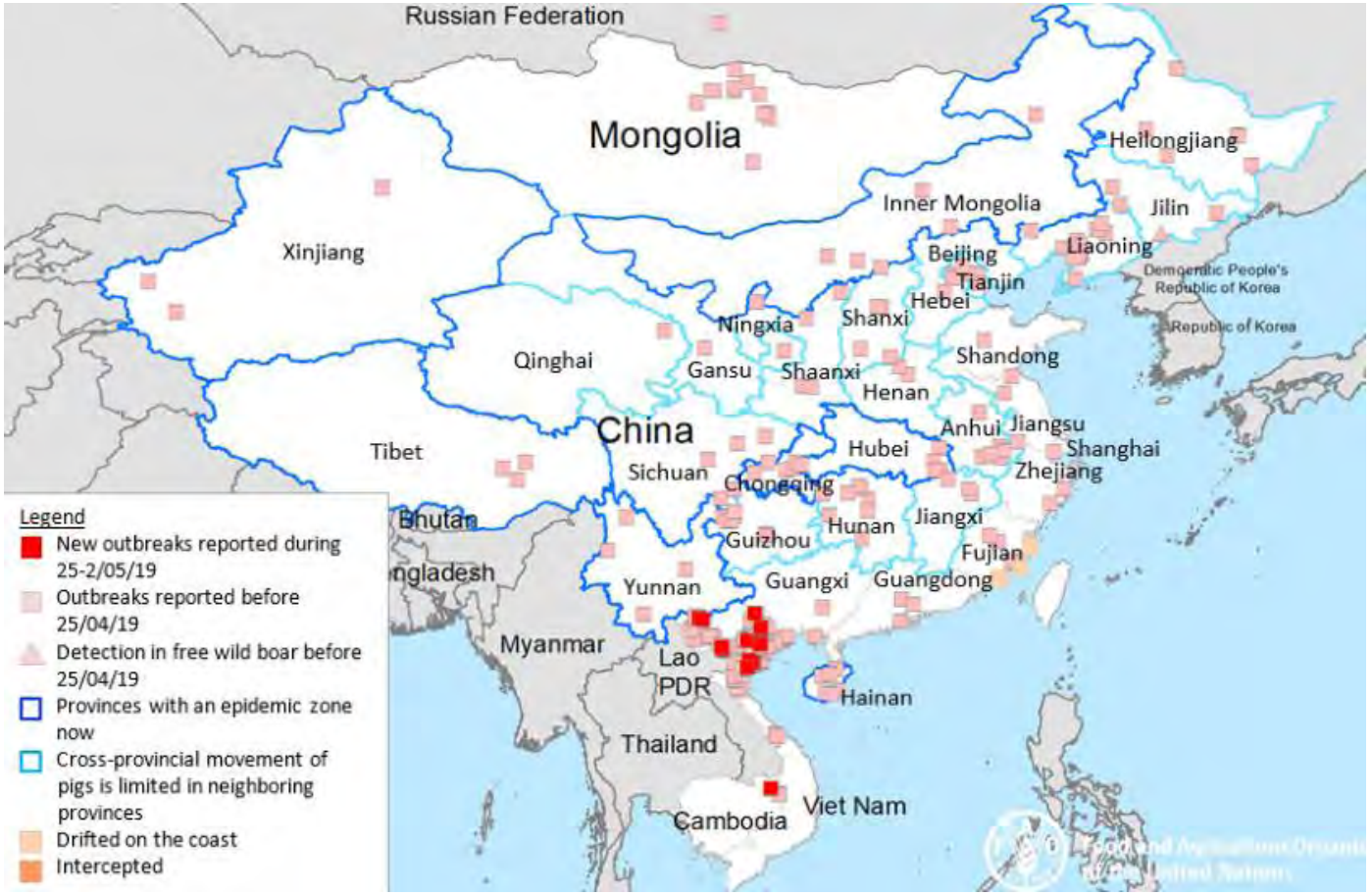


Figure 1. Global situation of ASF (2016-2018)

PSA distribuzione domestico/selvatico

Figure 4. Geographical occurrence of ASF in domestic pigs and wild boar based on official notifications to OIE in 2008-2018 (as of 31.05.2018).

***Map 1**. ASF situation in China (August 2018 to date)*



La peste suina africana

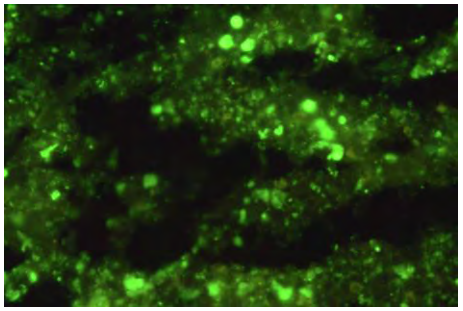
è diffusa in più di 55 paesi in 3 continenti e ha interessato sino ad ora oltre il 77% della popolazione suina mondiale

PSA il virus

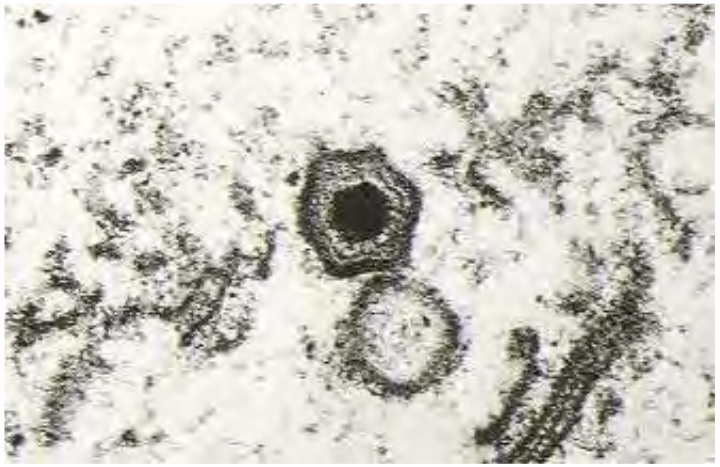
Il virus PSA è l'unico membro del genere ***asfivirus*** nella famiglia ***Asfarviridae***

E' l'unico virus DNA trasmesso da artropodi "arbor virus"

Ne esistono più di 20 genotipi diversi



"ASFAR"
African
Swine
Fever
And
Related viruses



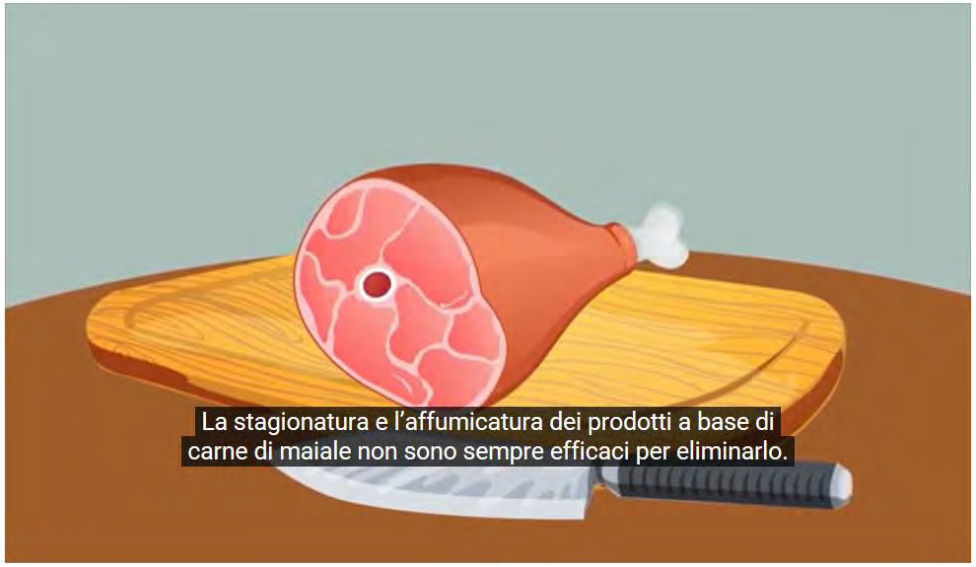
Virus PSA - Stabilità

✓rimane infettante entro un ampio range di pH (4-10)

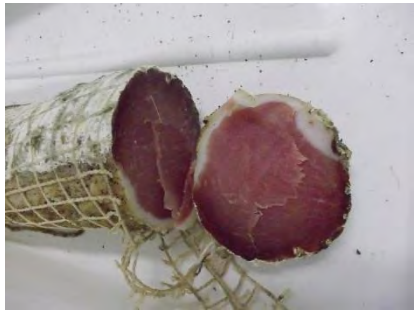
✓ciò consente al virus di sopravvivere nelle carni non cotte per settimane ed anche mesi

✓l'acidificazione normale delle carni non ha alcuna influenza se il pH non scende al di sotto di 4


Il virus può persistere per parecchi mesi
nell'ambiente e nelle carcasse.


La stagionatura e l'affumicatura dei prodotti a base di
carne di maiale non sono sempre efficaci per eliminarlo.





Product	Curing time (days)	Shelf-life (days)	Days of processing after which samples were:	
			positive	negative
Salami	27	90	18	26
Pork belly	14-21	90	60	137
Loin	60	90	83	137

Pig No	Processing day										
	6	11	18	26	32	39	47	54	60	83	137
	Virus isolation										
1	1/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2
2	2/2	2/2	2/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2
3	2/2	2/2	2/2	1/2	0/2	0/2	0/2	0/2	0/2	0/2	0/2
4	2/2	2/2	2/2	2/2	2/2	2/2	2/2	0/2	0/2	0/2	0/2
Pool	*In vivo* test										
1+2+3+4										Pos	Neg

Host Range

- ✓ Solo i membri della famiglia dei suidi (*Suidae*) sono recettivi all'infezione
- ✓ La malattia clinica è visibile solo nel suino domestico e nel cinghiale (entrambi *Sus scropha*)

Host Range

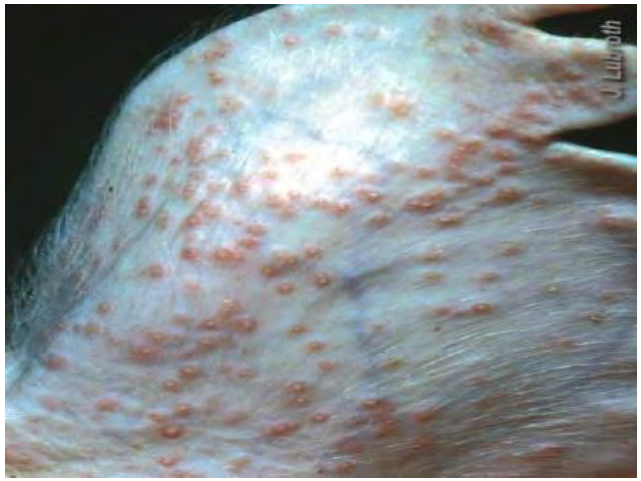
si ritiene che le zecche rappresentino l'ospite originale del virus

Zecche molli

Ornithodorus erraticus
Ornithodorus porcinus porcinus (moubata)



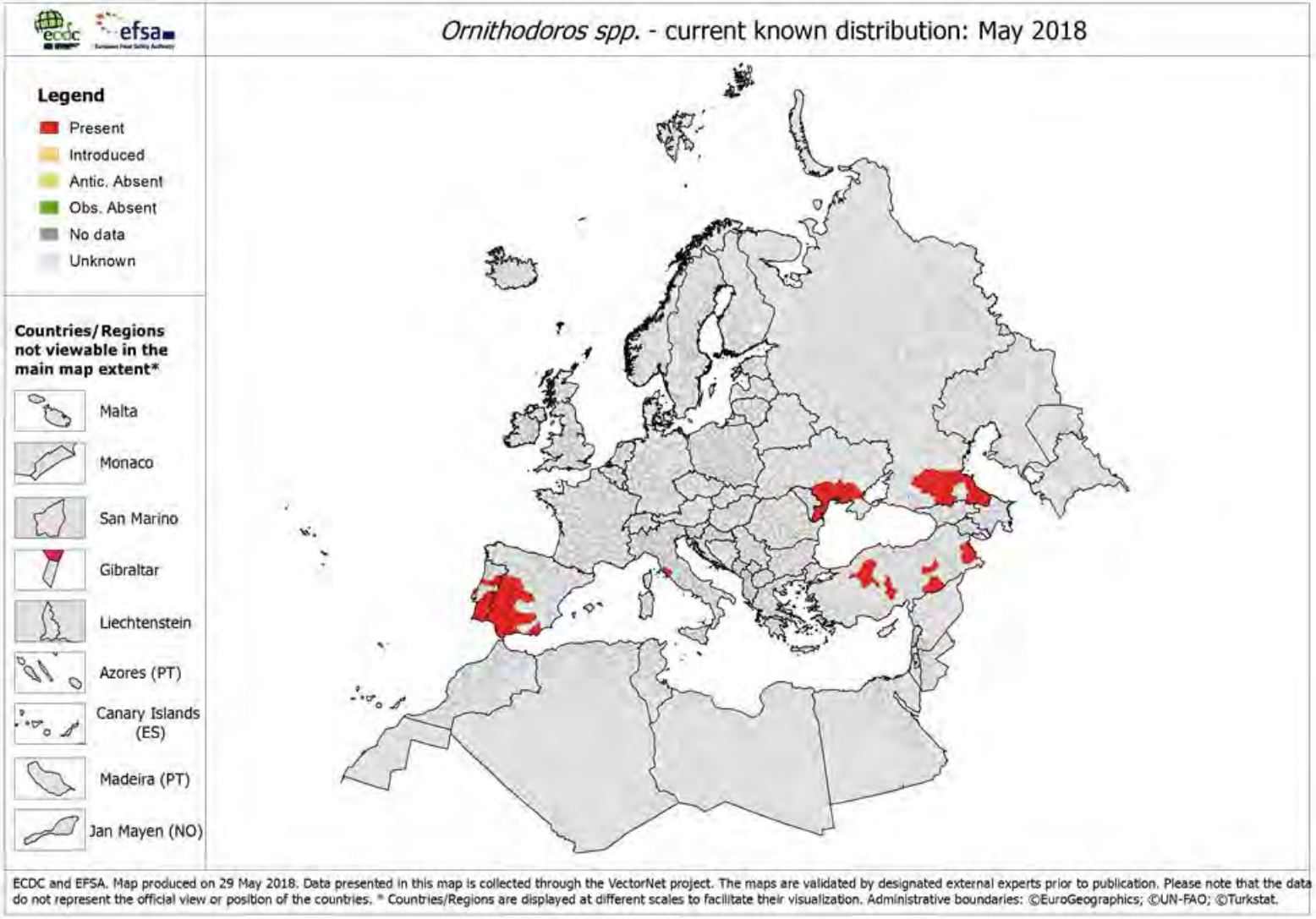
African Swine Fever Virus in Ticks (*Ornithodoros moubata*, Murray) collected from Animal Burrows in Tanzania



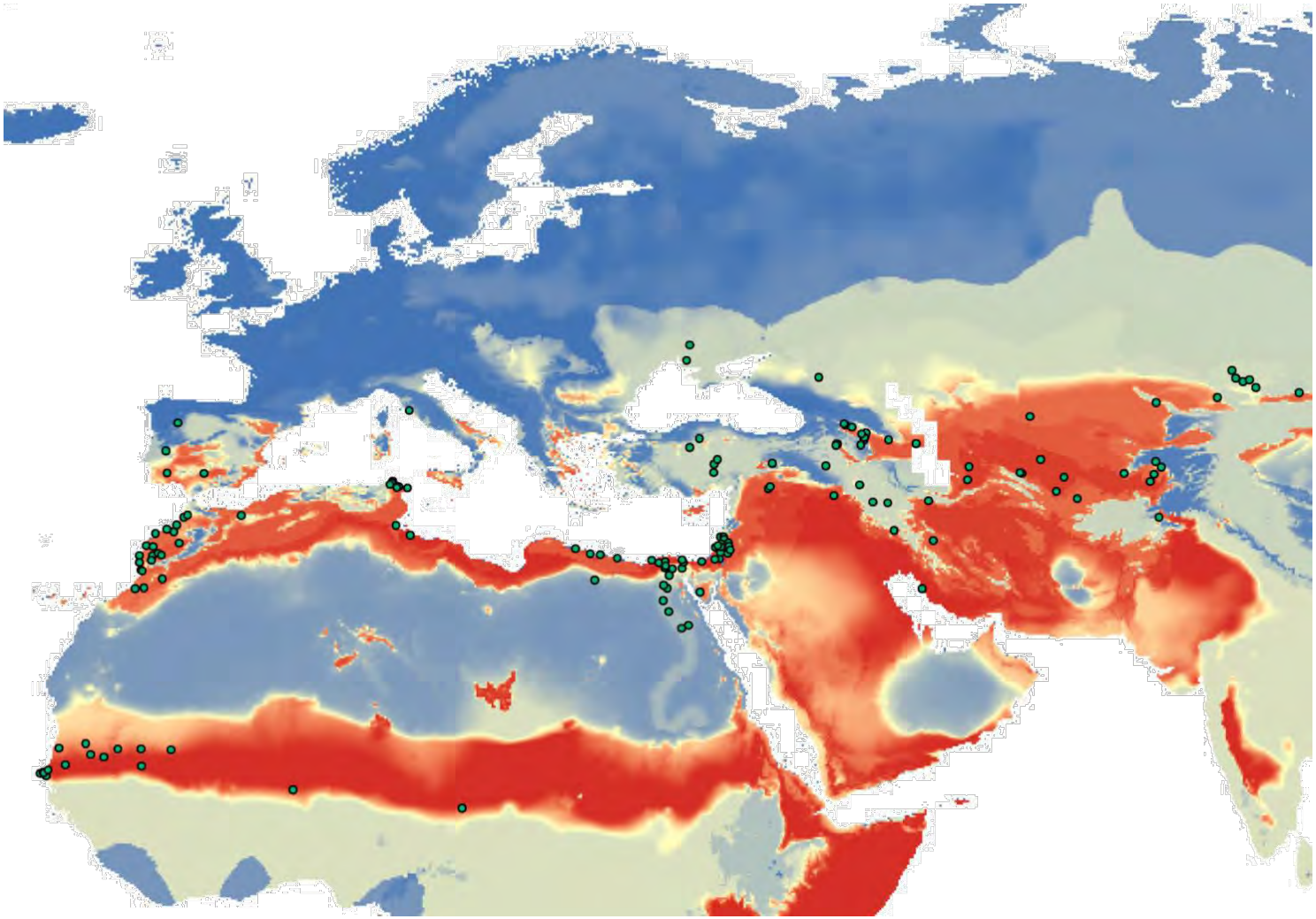
orecchio: punture da zecche Argasidae

Plowright W. et al. (1969) Nature 221:1071-1073

Ornithodoros spp



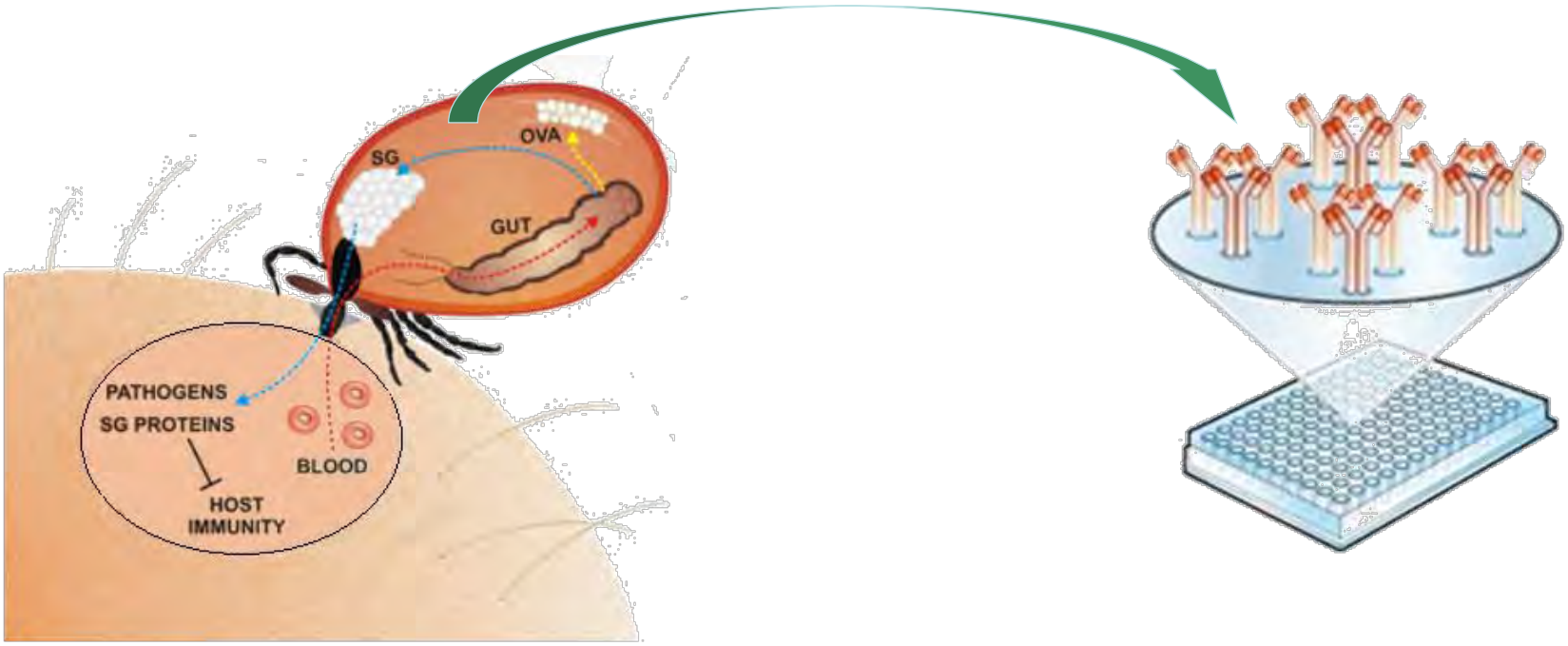
Aree climatiche compatibili con la presenza di Ornithodoros



Ci sono zecche in Sardegna?

Ornithodoros spp

metodi di indagine indiretta



Test ELISA indiretto

basato sull'antigene estratto dalle ghiandole salivari

Risultati

Transboundary and Emerging Diseases

Transboundary and Emerging Diseases

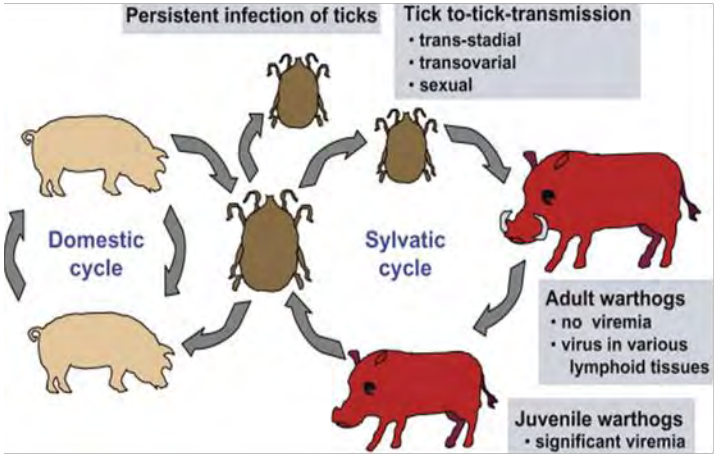
SHORT COMMUNICATION

Serological Surveillance and Direct Field Searching Reaffirm the Absence of *Ornithodoros Erraticus* Ticks Role in African Swine Fever Cycle in Sardinia

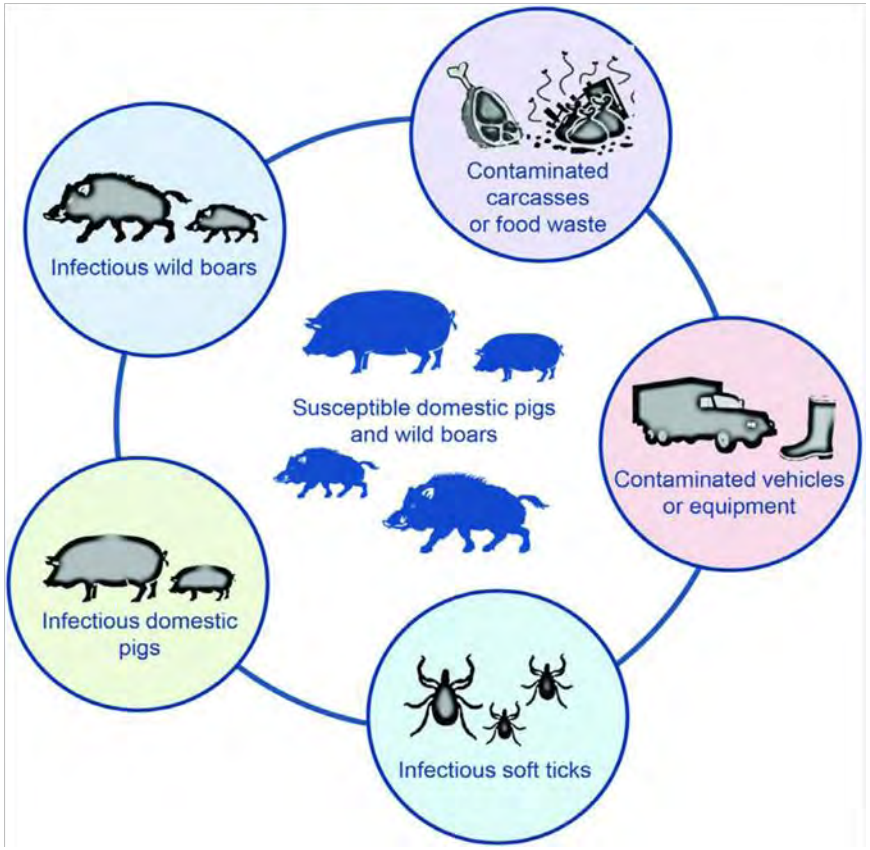
L. Mur[1,2], C. Iscaro[3], M. Cocco[4], C. Jurado[1], S. Rolesu[4], G. M. De Mia[3], F. Feliziani[3], R. Pérez-Sánchez[5], A. Oleaga[5] and J. M. Sánchez-Vizcaíno[1]

PSA Trasmissione

ciclo selvatico (in Africa)



ciclo domestico



PSA Trasmissione

✓Contatto diretto tra malato e sano

✓Attraverso rifiuti o residui di cucina infetti

✓Contatto indiretto (persone, veicoli, attrezzi, alimento ecc.)

PSA animali Carrier

Suidi selvatici africani

Facocero

Potamocero

Ilocero

Suini domestici

PSA Carrier Status

ovvero

animali persistentemente infetti

- ✓Animali convalescenti possono diventare *carrier*
- ✓Presenza contemporanea di Virus + Ab
- ✓Possibili fenomeni di riacutizzazione ed eliminazione virale
- ✓Reale incidenza ?
- ✓Durata? (evidenze fino a 11 mesi dall'infezione)

The Veterinary Journal 233 (2018) 41–48

Contents lists available at ScienceDirect

The Veterinary Journal

journal homepage: www.elsevier.com/locate/tvjl

Review

African swine fever: A re-emerging viral disease threatening the global pig industry

P.J. Sánchez-Cordón[1], M. Montoya, A.L. Reis, L.K. Dixon*

The Pirbright Institute, Pirbright, Woking, Surrey GU24 0NF, UK

ARTICLE INFO

Keywords:
African swine fever
Control
Epidemiology
Immune responses
Pathogenesis
Vaccination

ABSTRACT

African swine fever (ASF) recently has spread beyond sub-Saharan Africa to the Trans-Caucasus region, parts of the Russian Federation and Eastern Europe. In this new epidemiological scenario, the disease has similarities, but also important differences, compared to the situation in Africa, including the substantial involvement of wild boar. A better understanding of this new situation will enable better control and prevent further spread of disease. In this article, these different scenarios are compared, and recent information on the pathogenesis of ASF virus strains, the immune response to infection and prospects for developing vaccines is presented. Knowledge gaps and the prospects for future control are discussed.

The existence of sub-clinical or inapparent infections has also been suggested in survivor pigs, which are infected but do not display clinical signs or the lesions described in chronic disease. Virus can persist for prolonged periods in tissues or blood from recovered pigs or following infection with low virulence isolates, which might contribute to virus transmission, disease persistence, sporadic outbreaks and ASFV introduction into disease-free zones (Penrith and Vosloo, 2009; Costard et al., 2013; Gallardo et al., 2015). Recent studies in Africa have identified ASFV sequences in apparently healthy pigs in Uganda (Kalenzi Atuhaire et al., 2013) and Kenya (Thomas et al., 2016), suggesting that reduced virulence isolates may be circulating in these regions. There is limited experimental evidence for transmission from persistently infected to naïve animals. The relevance of carrier animals in the field is not clear.

A potential role of carrier domestic pigs as a source of infection has been suggested in Kenya and Uganda, in which healthy pigs can

Received: 23 January 2018
DOI: 10.1111/tbed.12881

ORIGINAL ARTICLE

WILEY Transboundary and Emerging Diseases

No evidence for long-term carrier status of pigs after African swine fever virus infection

A. Petrov[1] | J. H. Forth[2] | L. Zani[1] | M. Beer[1] | S. Blome[1]

[1]Institute of Diagnostic Virology, Friedrich-Loeffler-Institut, Insel Riems, Germany

[2]Institute of Infectology, Friedrich-Loeffler-Institut, Insel Riems, Germany

Correspondence
Sandra Blome, Friedrich-Loeffler-Institut, Institute of Diagnostic Virology, Insel Riems, Germany.
Email: sandra.blome@fli.de

Present address
A. Petrov, IDT Biologika (Riems) GmbH & Co. KG, Insel Riems, Germany.

Funding information
Friedrich-Loeffler-Institut, Intramural Funding

Summary

This study targeted the assessment of a potential African swine fever virus (ASFV) carrier state of 30 pigs in total which were allowed to recover from infection with ASFV "Netherlands'86" prior exposure to six healthy sentinel pigs for more than 2 months. Throughout the whole trial, blood and swab samples were subjected to routine virological and serological investigations. At the end of the trial, necropsy of all animals was performed and viral persistence and distribution were assessed. Upon infection, a wide range of clinical and pathomorphological signs were observed. After an initial acute phase in all experimentally inoculated pigs, 66.6% recovered completely and seroconverted. However, viral genome was detectable in blood samples for up to 91 days. Lethal outcomes were observed in 33.3% of the pigs with both acute and prolonged courses. No ASFV transmission occurred over the whole in-contact phase from survivors to sentinels. Similarly, infectious ASFV was not detected in any of the tissue samples from ASFV convalescent and in-contact pigs. These findings indicate that the suggested role of ASFV survivors is overestimated and has to be reconsidered thoroughly for future risk assessments.

KEYWORDS
African swine fever, carrier state, long-term persistence, transmission, virus shedding

PSA Immunità

- ✓Immunità umorale non effettiva
- ✓Anticorpi neutralizzanti non protettivi
- ✓Protezione legata prevalentemente a complicati meccanismi che coinvolgono l'immunità aspecifica
- ✓No vaccini

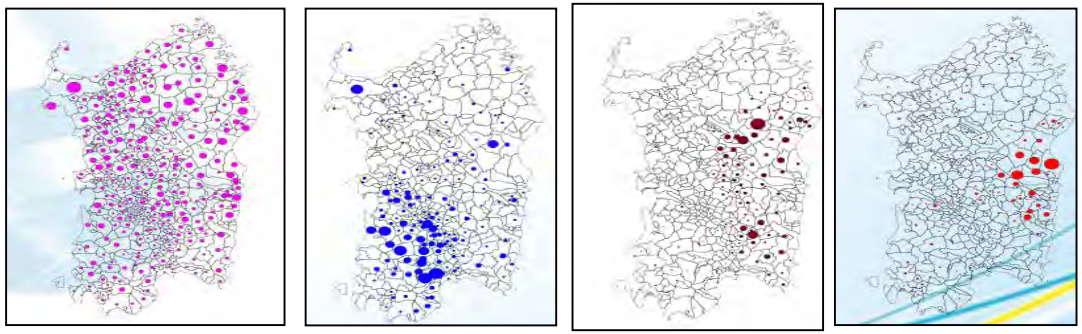
Principali ostacoli alla creazione di vaccini

- ✓Virus inattivato non induce protezione
- ✓Passaggi seriali di vaccini attenuati hanno causato negli anni ‘60 reazioni post-vaccinali in 129.000 su 550.000
- ✓Virus molto complesso (> 50 proteine)
- ✓Anticorpi neutralizzanti non effettivi

PSA principali fattori di rischio

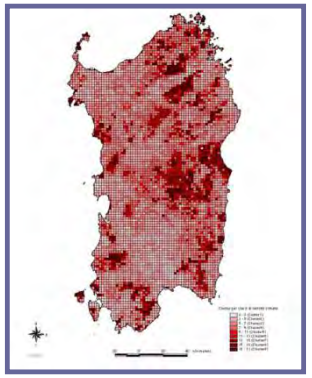
- ✓ backyard

Pig breeding system



Backyard (90,34 %) | Intensive (1,80 %) | Confined-free ranging (5,06 %) | Free ranging (2,78 %)

- ✓ Contatto di suini infetti e cinghiali



Wild boar population

- ✓ Movimentazioni di uomini, animali e prodotti infetti

PSA Virulenza

marcate variazioni di virulenza degli isolati

✓Alta virulenza - 10-100 % mortalità (7-10 gg p.i.)

✓Moderata virulenza – malattia (sub)acuta, alta % di sopravvivenza

✓Bassa virulenza – solo sieroconversione

PSA definizione

✓Malattia virale altamente (?) contagiosa con mortalità anche fino al 100% come risultato di una febbre emorragica

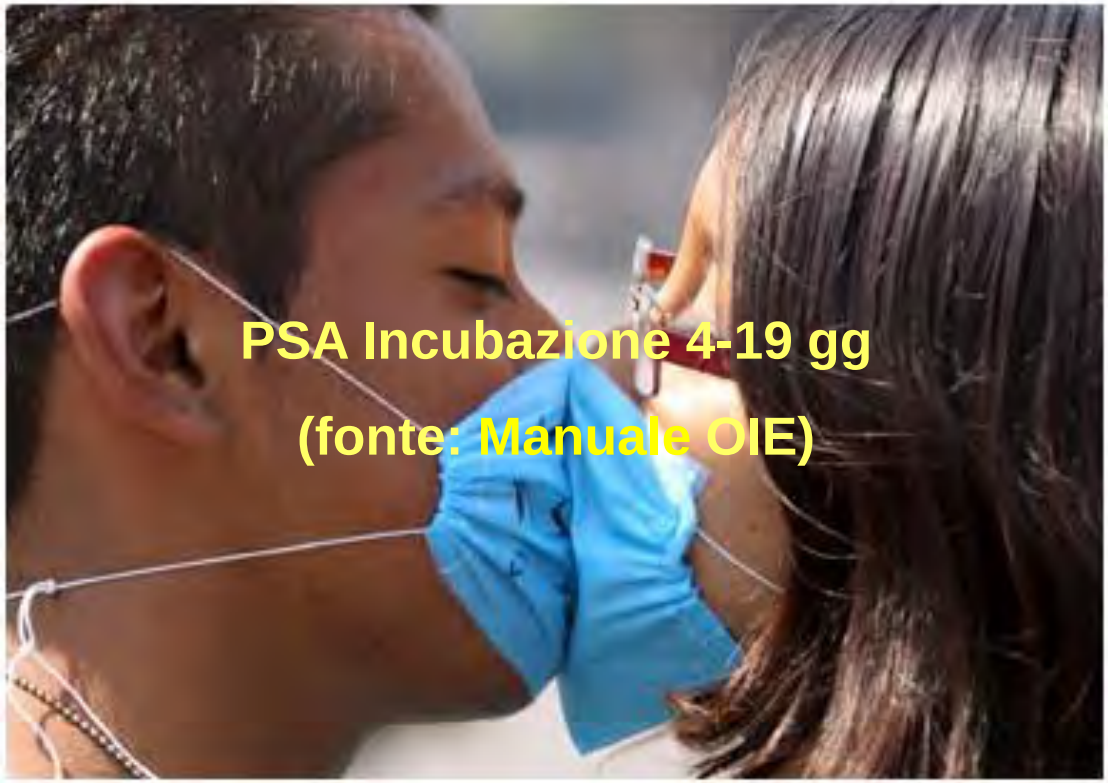
✓Caldi, malati, rossi (hot, sick, red pigs)

Perché un sospetto di PSA ?

✓ La rapidità con cui viene avanzato il sospetto di Peste è essenziale

✓Spesso si verificano incomprensibili ritardi nel riconoscimento della malattia e nell'applicazione delle conseguenti misure

✓Con la conseguenza di una dannosa dilatazione del "periodo a rischio"


PSA Incubazione 4-19 gg
(fonte: Manuale OIE)

https://www.efsa.europa.eu/en/topics/topic/african-swine-fever


Diarrea (a volte con presenza di sangue)


Pelle di colore rosso o blu,
in particolare attorno alle orecchie e al muso,

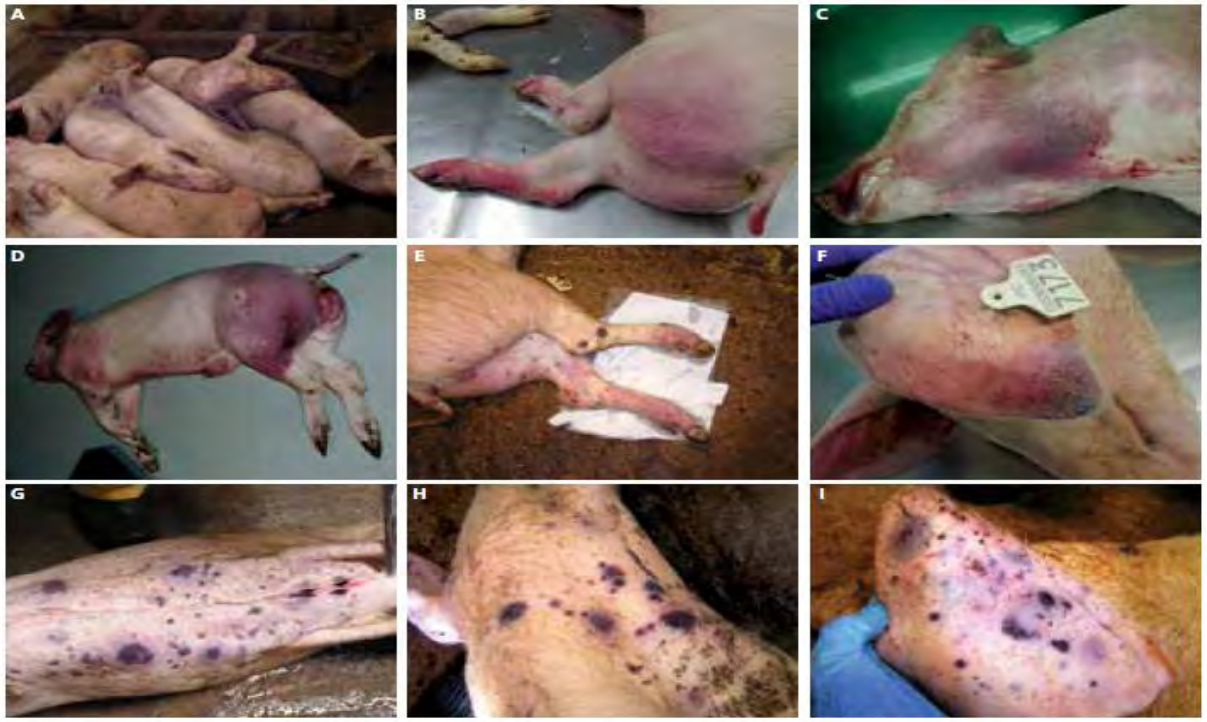

tosse e difficoltà di respirazione,


aborti spontanei, prole nata morta o debole.


La maggior parte degli animali
malati muore nell’arco di 10 giorni.

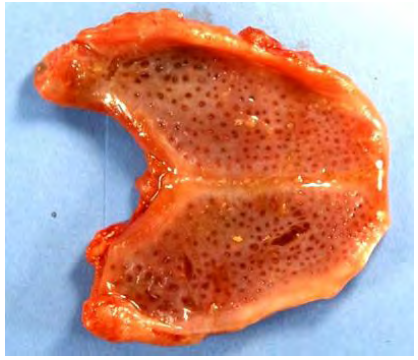

IZS-UMBRIAeMARCHE©

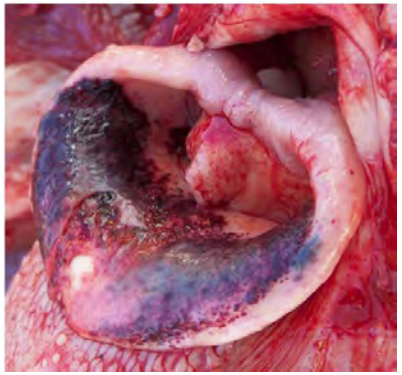
FIGURE 12
Clinical signs of acute African swine fever

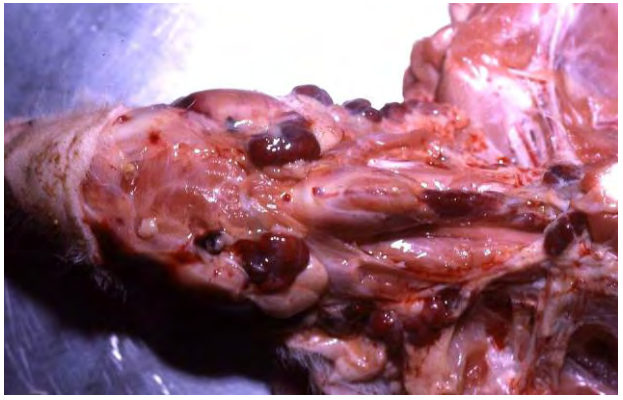


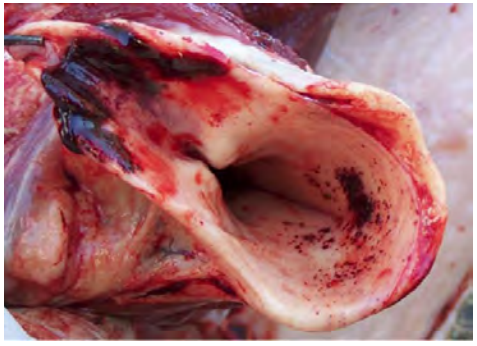
A. *Pigs are visibly weak with fever and huddle to stay warm.*
B-E. *Bloody diarrhoea and distinct hyperaemic (red) areas on skin of neck, chest and extremities.*
F. *Cyanosis (bluing) at the tips of ears.*
G-I. *Necrotic lesions on skin of the abdomen, neck and ears.*

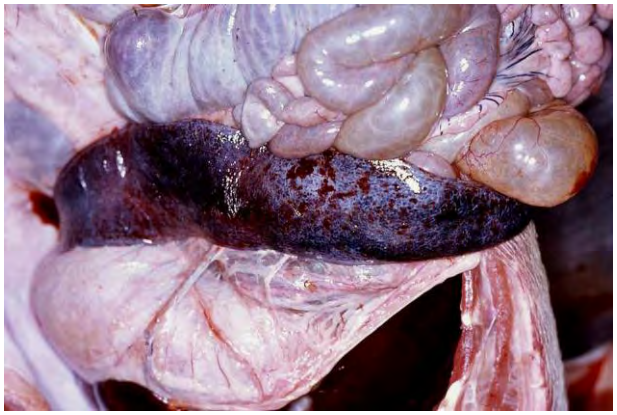
Fonte: FAO Manual – African Swine Fever detection and diagnosis

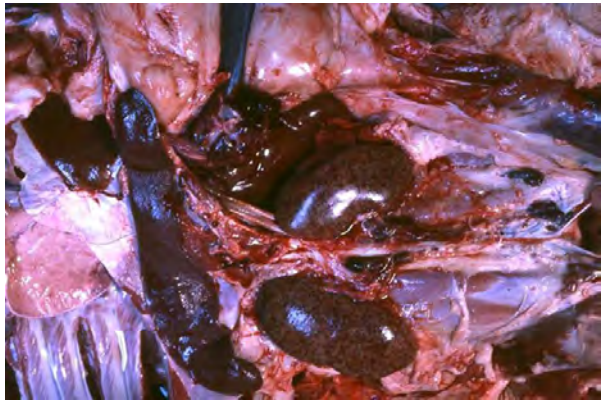


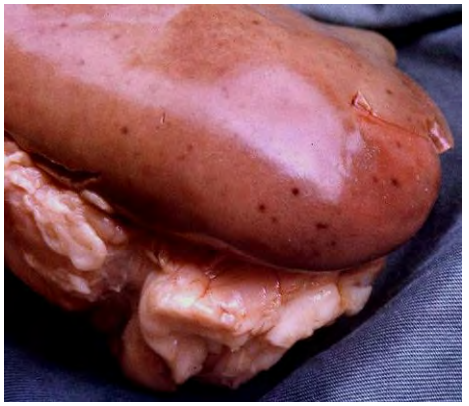




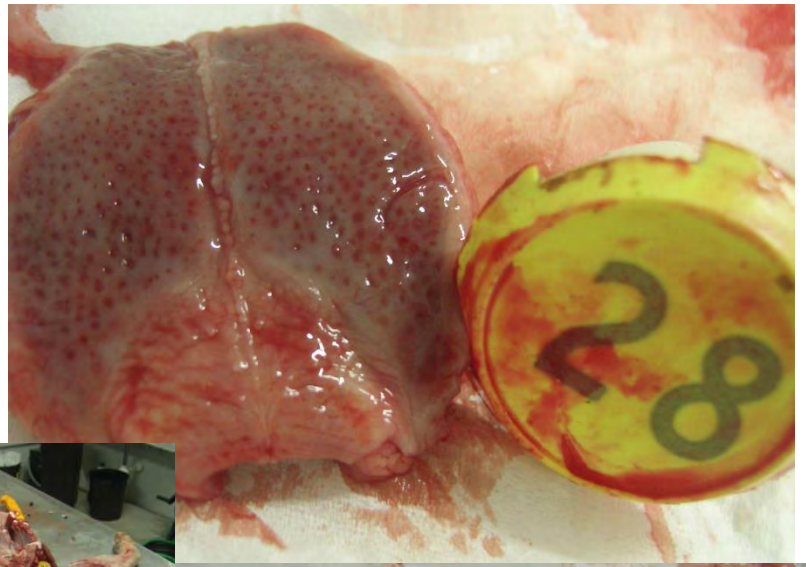


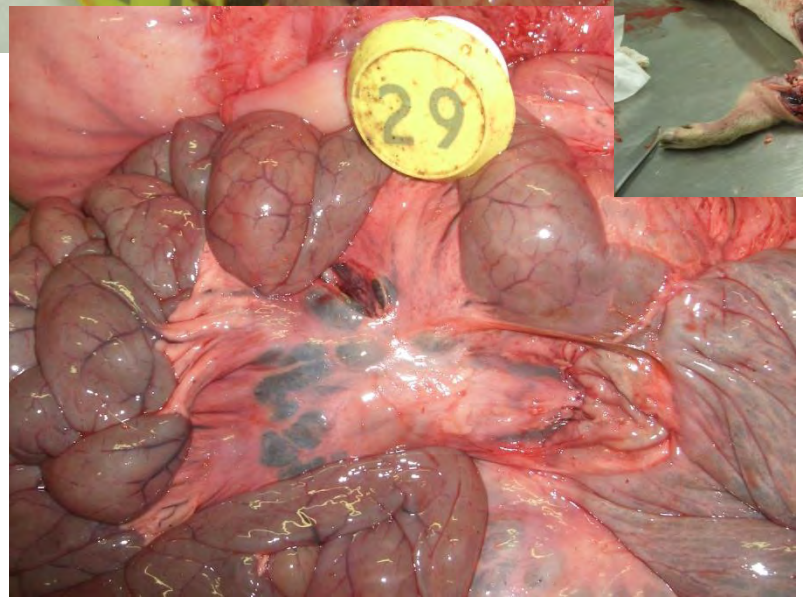




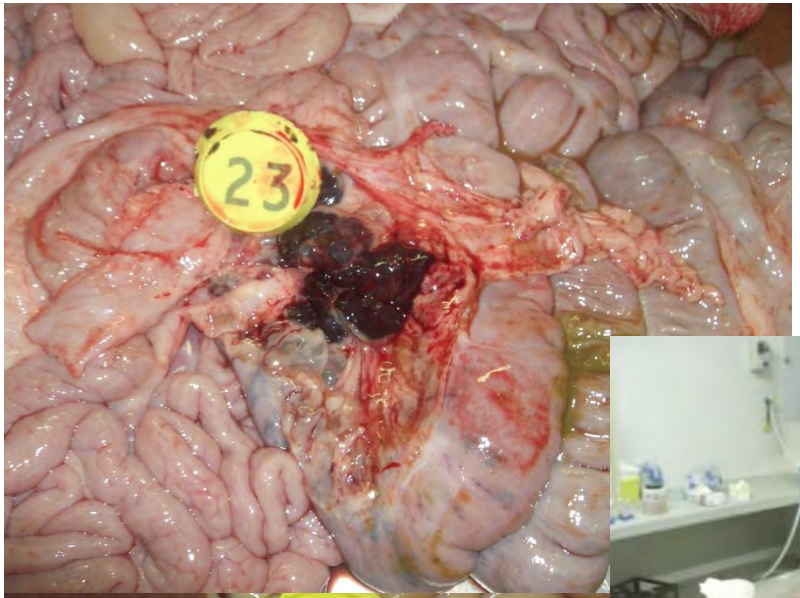


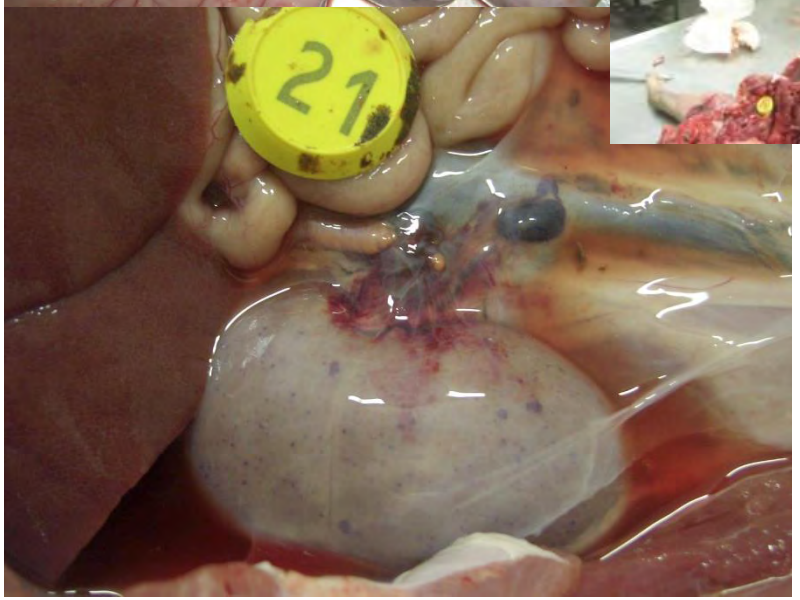

21


28


29


23


23


21


21

PSA forme Croniche

- ✓Febbri transitorie e ricorrenti
- ✓Crescita stentata
- ✓Pneumonia
- ✓Ulcere cutanee
- ✓Problemi articolari

FIGURE 17

Typical lesions observed in chronic forms of African swine fever

A-F. *Moderate to severe joint swelling, often combined with reddened areas of skin that become raised and necrotic.*

G. *Additional necropsy findings include edematous lymph nodes.*

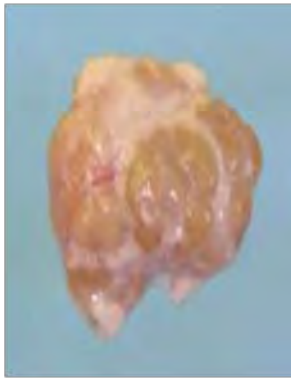
H. *Pneumonia with caseous necrosis and mineralization of the lungs.*

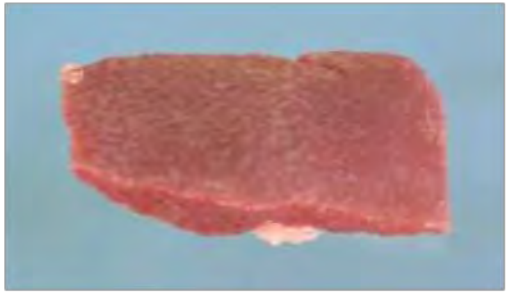
Fonte: FAO Manual – African Swine Fever detection and diagnosis

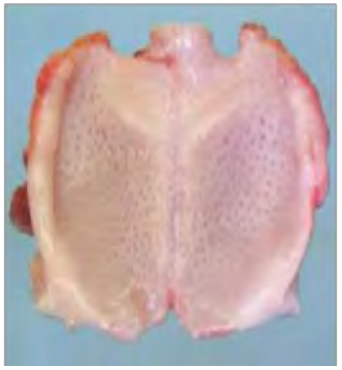
PSA Diagnosi

Cosa prelevare

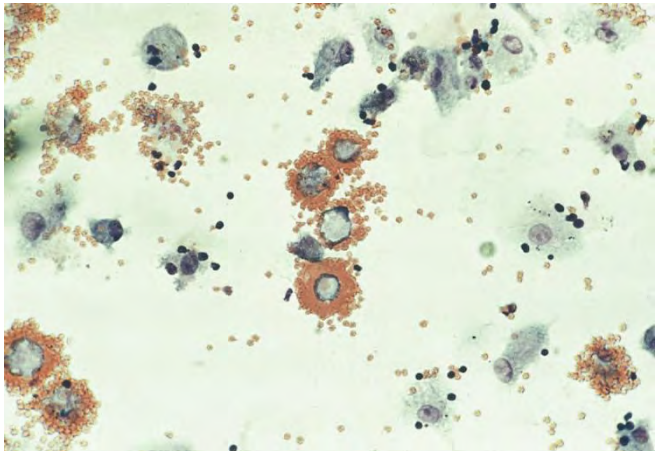
- ✓Sangue coagulato
- ✓Sangue EDTA (eparinato)
- ✓Linfonodi
- ✓Milza
- ✓Tonsilla
- ✓Polmone
- ✓Rene



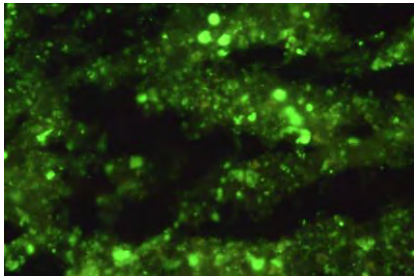




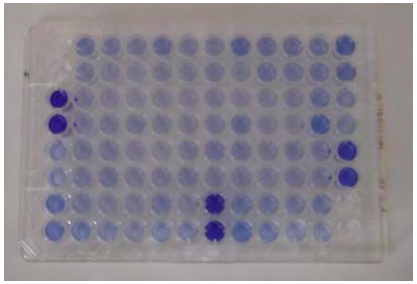
PSA diagnosi diretta



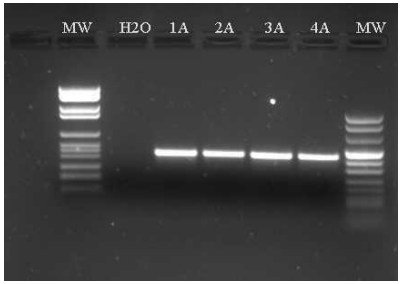
Malmquist, 1960

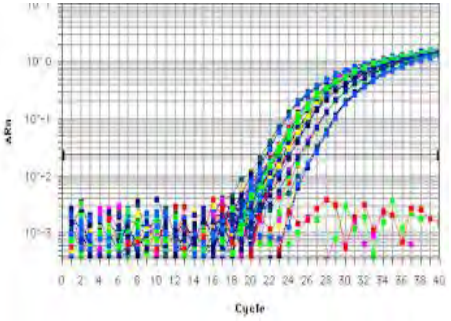


IFD



ELISA-Ag





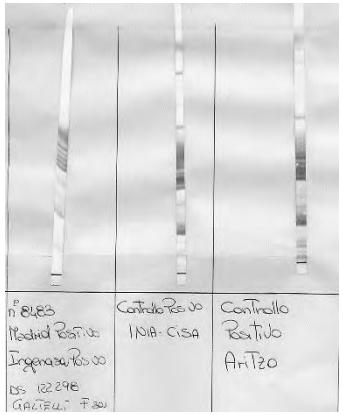
PCR & Real Time PCR

PSA diagnosi indiretta

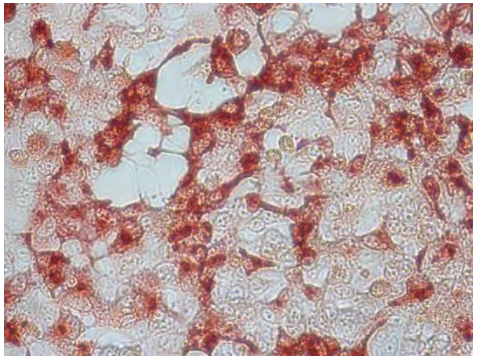
ELISA-Ab

Screening

No anticorpi neutralizzanti!



IB



IPT

Conferma

Grazie per l'attenzione

Montesilvano (Pescara)
Bagni Bruno

Montesilvano (Pescara)
Bagni Le Naiadi

20 settembre 2016

Laconi, il maiale schiaccia un pisolino sul divano bianco

Sorpresa nell' agriturismo Genna 'e Corte: l'animale si è introdotto in una sala e non ha saputo resistere alla tentazione di concedersi, almeno per una notte, il lusso di un sonnellino nel confort
di **Ivana Fulghesu**