KEY POINTS FOR ASF ERADICATION.
The Spanish Model

ASF Reference Laboratory

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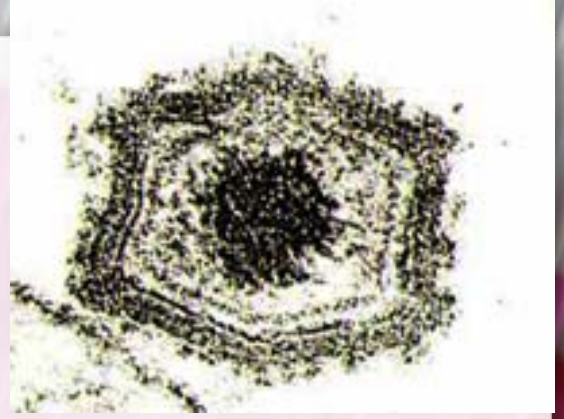
ASFV: A old friend 1978-

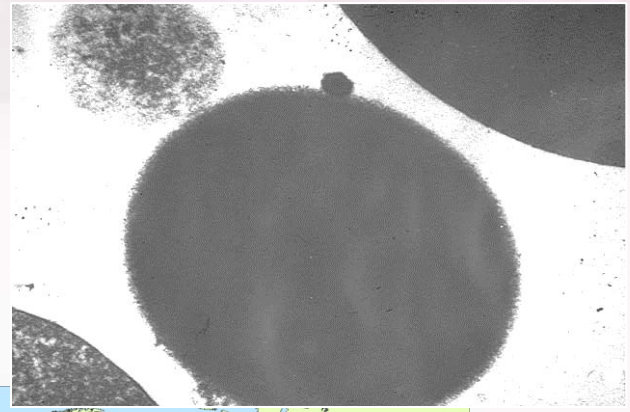
ASF REFERENCE LABORATORY

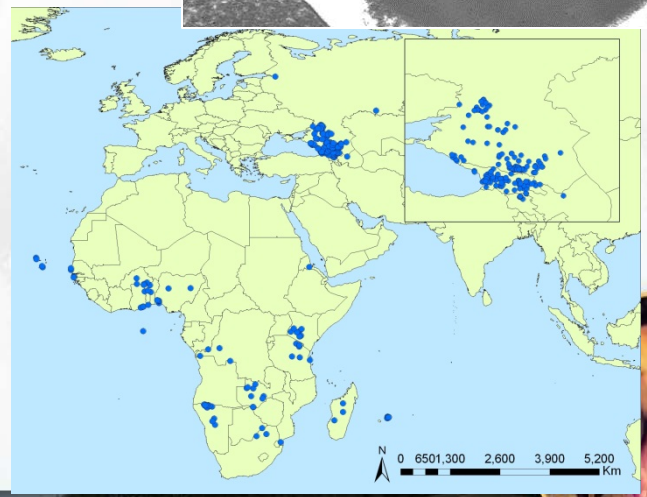
MAIN WORK:
DIAGNOSIS and
ERADICATION MODELS

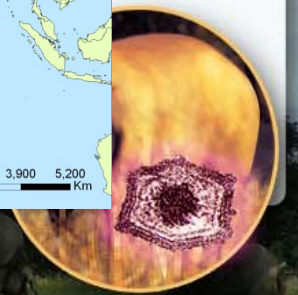
AGENDA:

- ASF. A REEMERGING DISEASE
- EPIDEMIOLOGICAL SITUATION
- CRITICAL POINTS
- ASF VACCINE
- ASF ERADICATION
- THE SPANISH MODEL

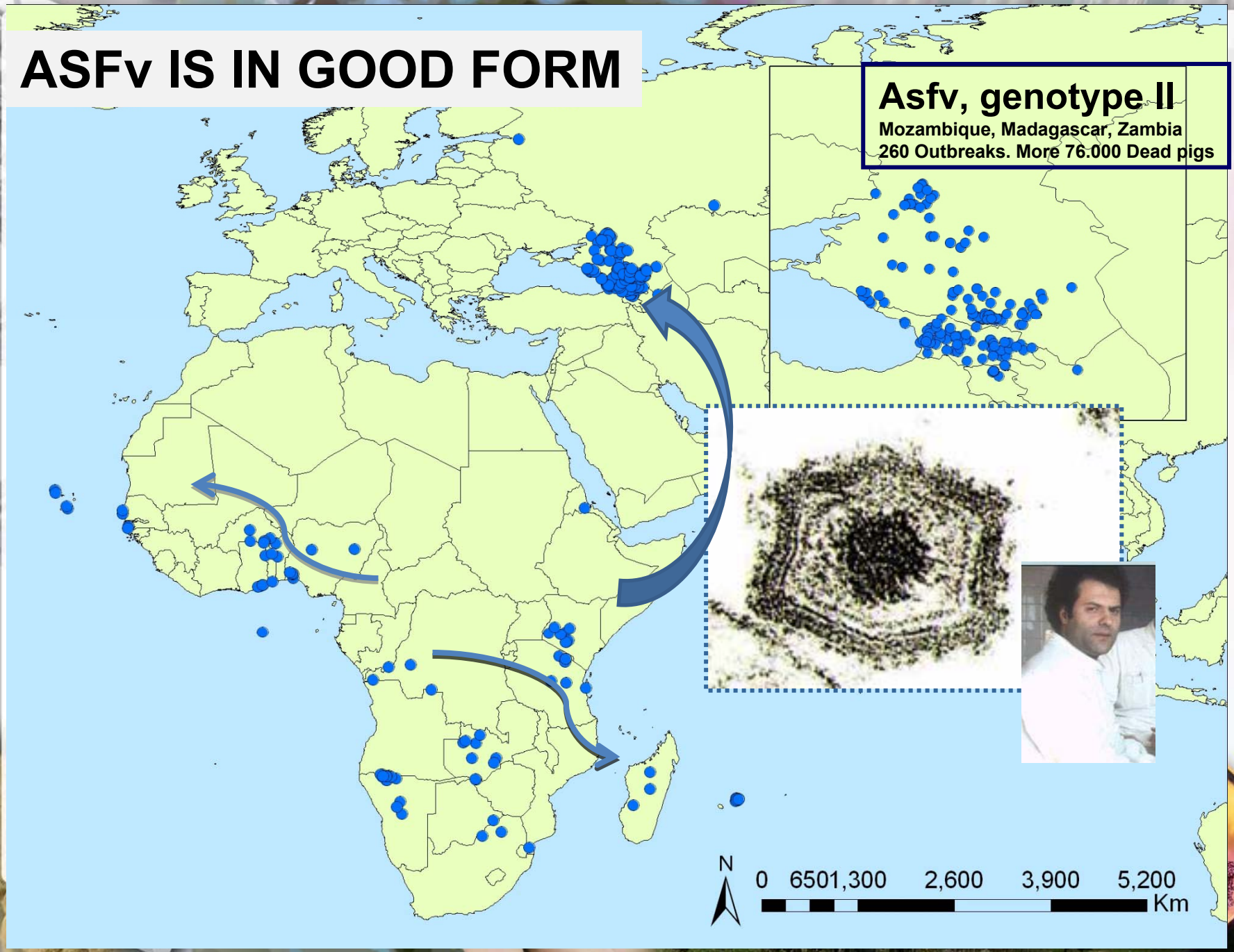


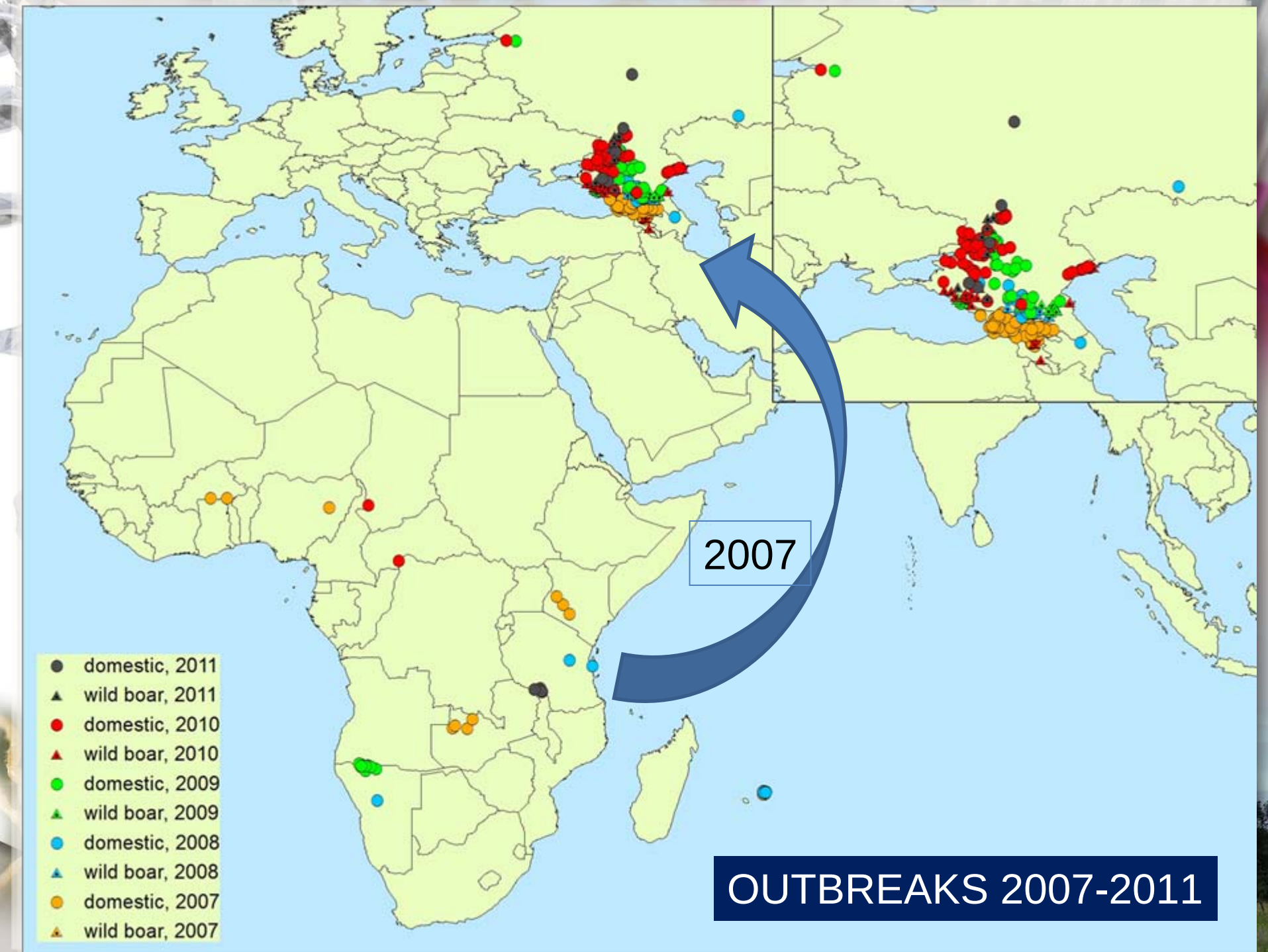






ASFv IS IN GOOD FORM




2007
domestic, 2011
wild boar, 2011
domestic, 2010
wild boar, 2010
domestic, 2009
wild boar, 2009
domestic, 2008
wild boar, 2008
domestic, 2007
wild boar, 2007
OUTBREAKS 2007-2011

ASF 2007-2011

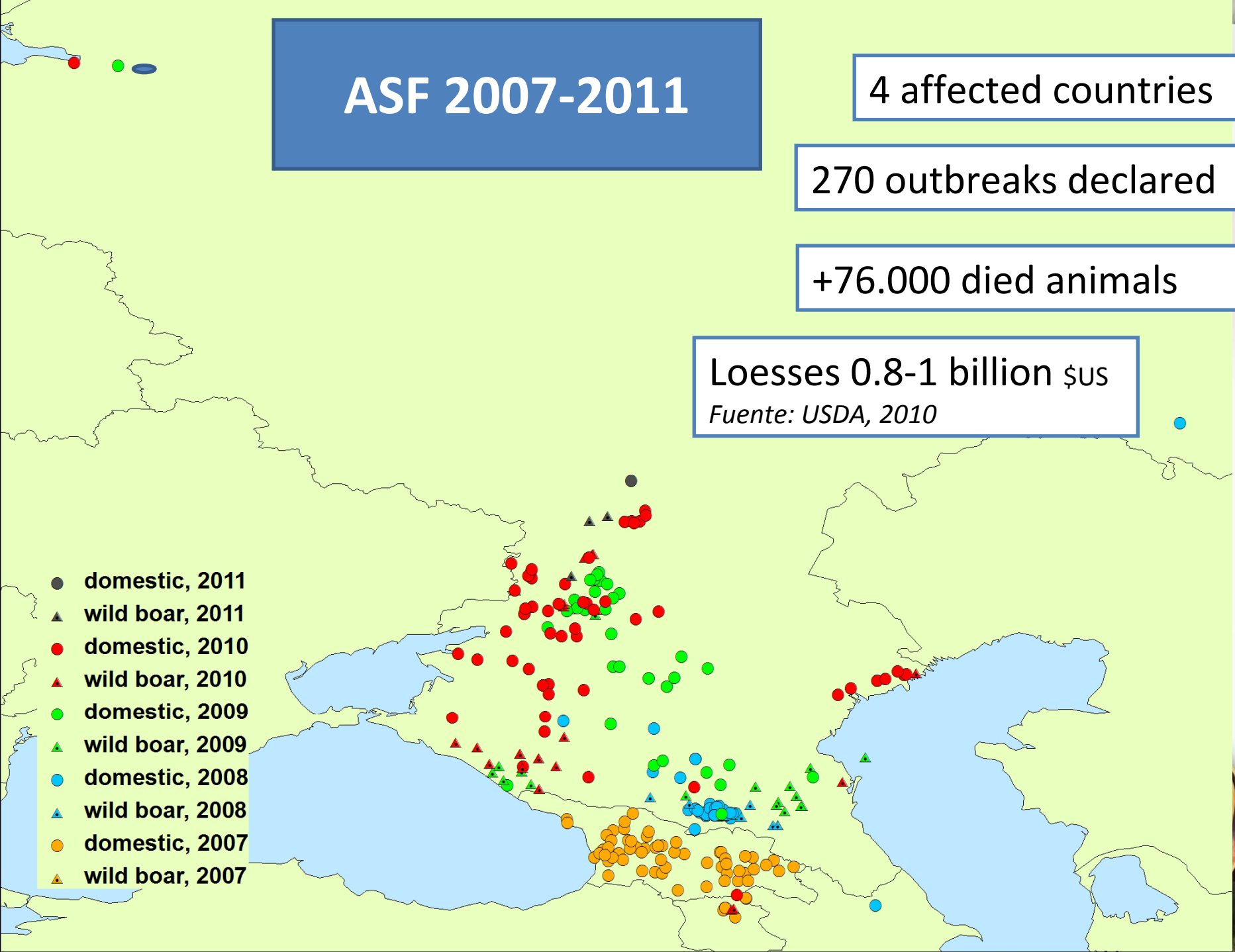
4 affected countries

270 outbreaks declared

+76.000 died animals

Loesses 0.8-1 billion $US

Fuente: USDA, 2010



AFRICAN SWINE FEVER IMPORTANCES POINTS FOR CONTROL AND ERADICATION


Domestic & Wild animals affected

22 genotypes

Only type II RF

High variability


Pigs &products

No vaccine available

PROBLEMS FOR ASF CONTROL

Ticks

Carrier animals

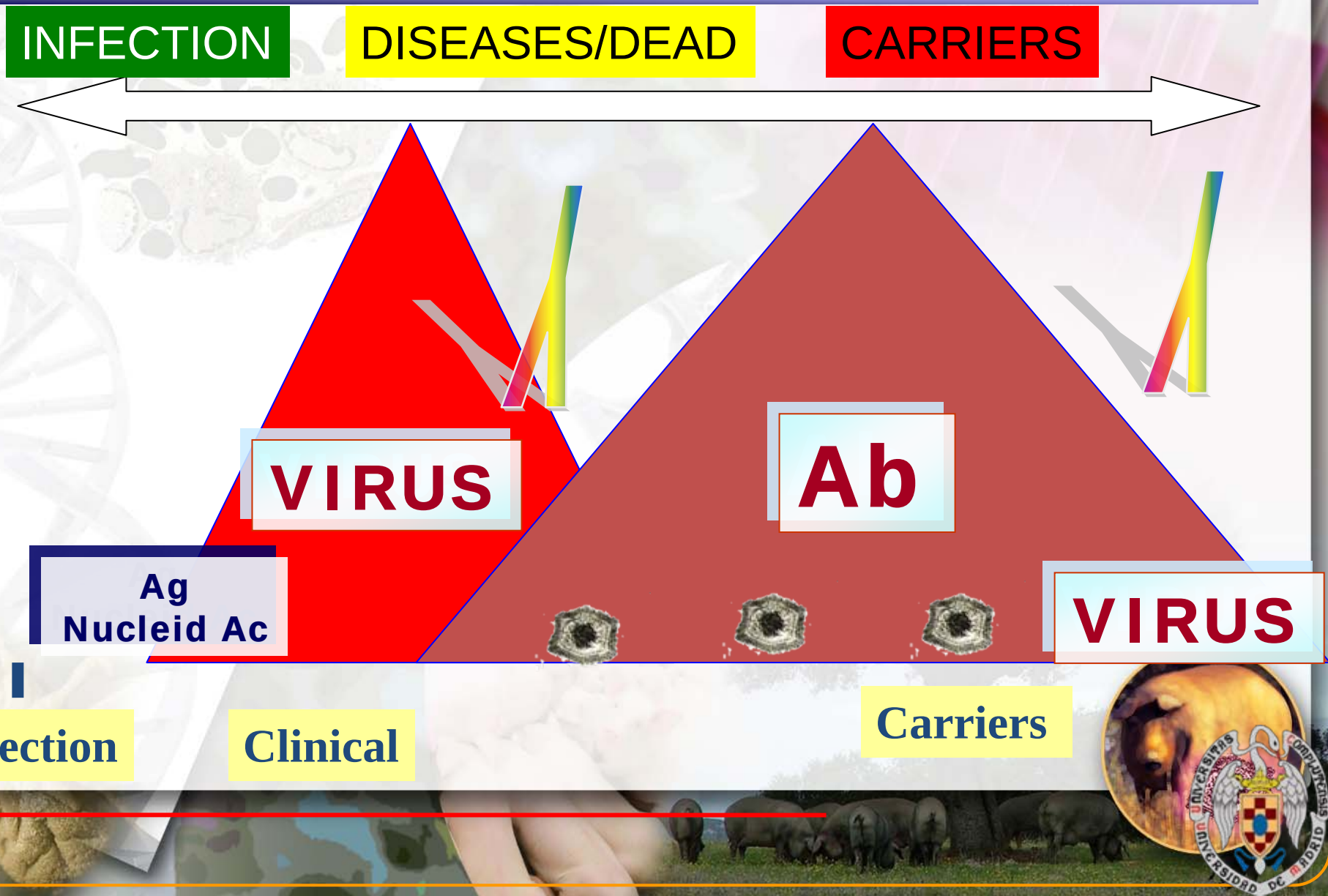
Freezer

Very resistant in the environment

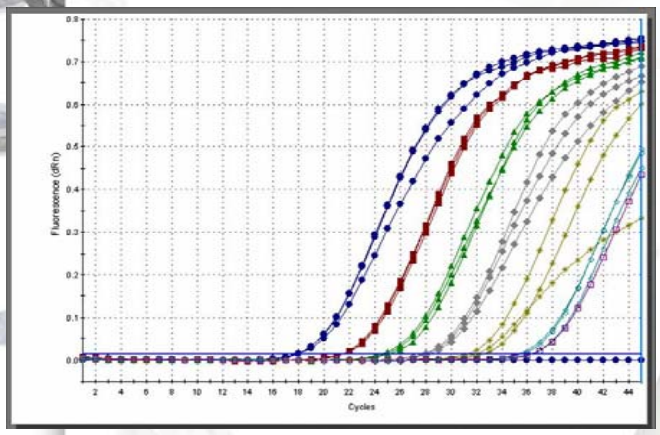
Clinical signs similar to other diseases CSF

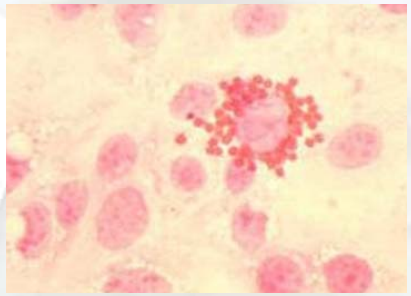
Laboratory diagnosis needed

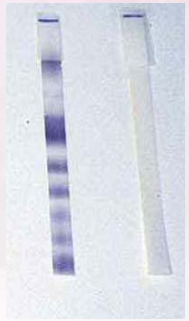
ASF DIAGNOSIS:

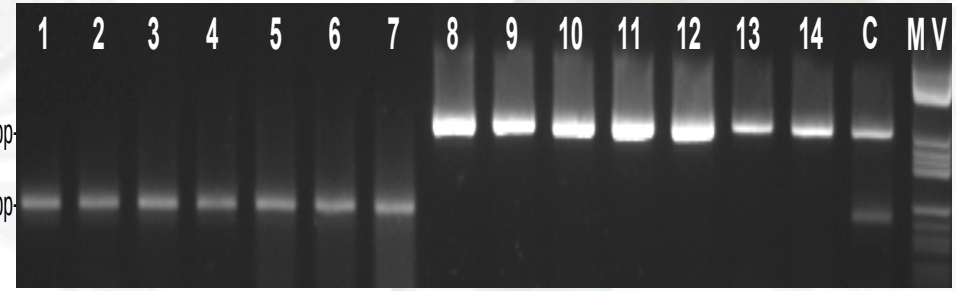


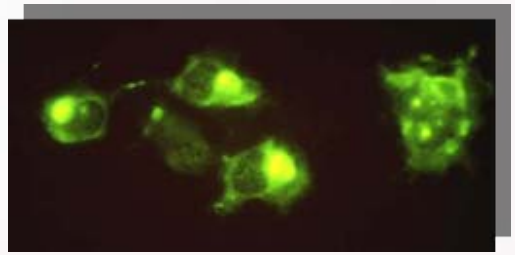
ASF LABORATORY DIAGNOSIS



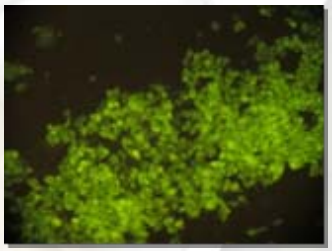








PPC-3/4 + PPA-1/2



GOOD HEALTH

ASF LABORATORY DIAGNOSIS

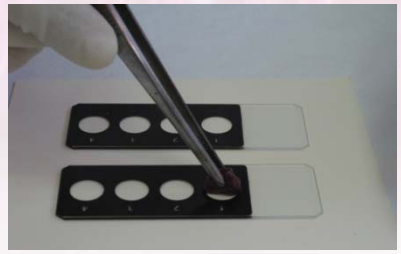
Antigen Detection

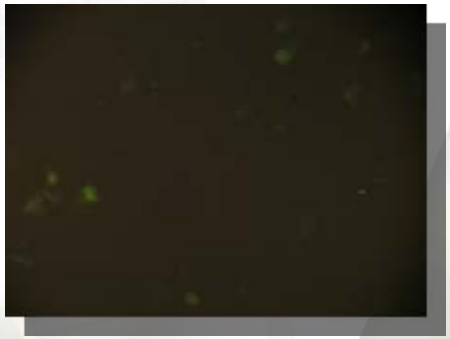
- *Direct immunofluorescence (DIF)*

TIME 75 MINUTES

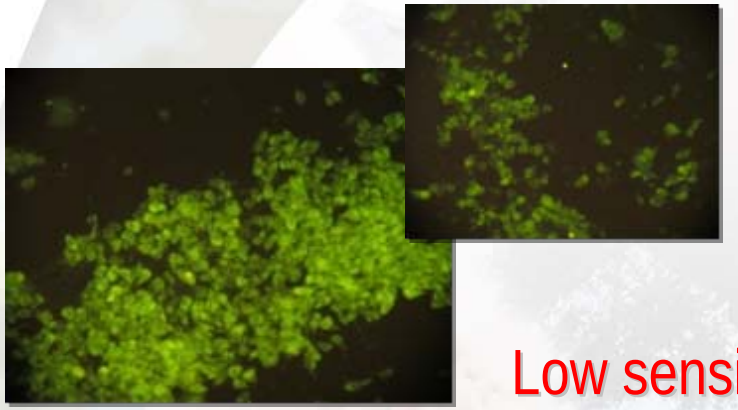
Easy to use

Personal trained needed to interpretate the results





NEGATIVE



POSITIVE

Low sensitivity in subacute and chronic forms

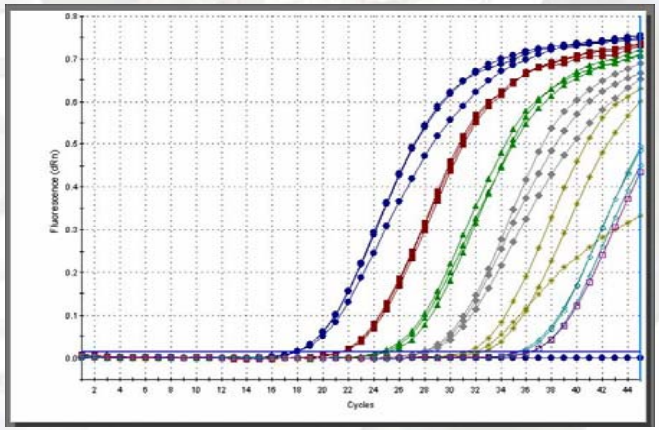
Significant lack of sensitivity due to Ag-Ab complex formation. Not recomended for analysis of serum and tissue –homogenated samples after first week pi. due to false negative results.

ASF LABORATORY DIAGNOSIS

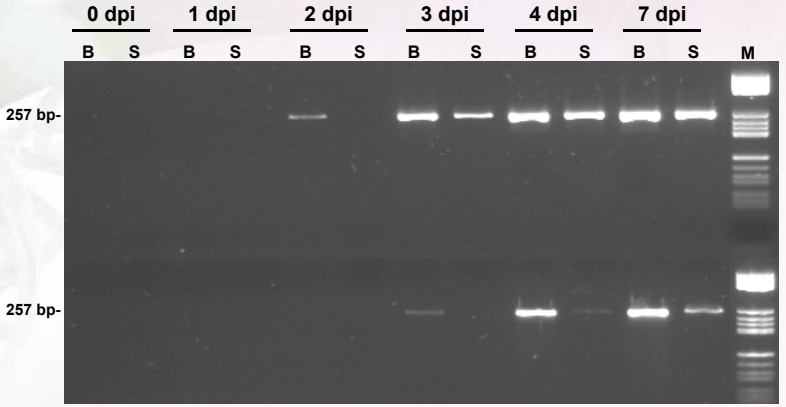
DNA Detection

TIME: 5 to 6 H

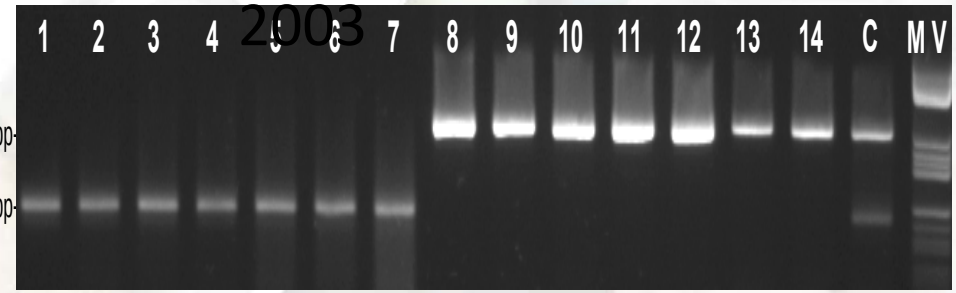
PCR: CONVENTIONAL and REAL TIME



King *et al.*, 2003



Agüero *et al.*, 2003



PPC-3/4 + PPA-1/2

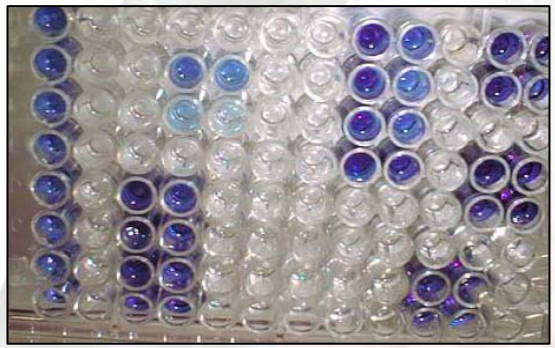
Agüero*et al.*, 2004

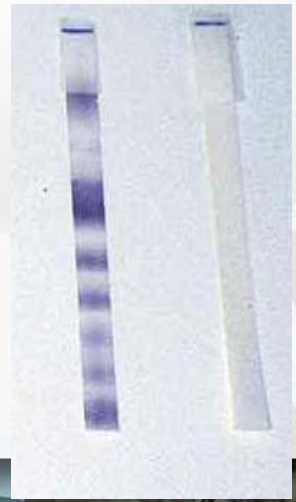
MOST COMMONLY USED

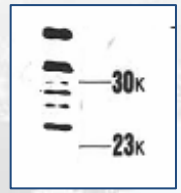
ASF Reference Laboratory

Develop new procedures for diagnosis and control of ASF:

- Indirect ELISA
- Immunoblotting technique







ASF Reference Laboratory

Evaluate new procedures for diagnosis and control of the disease

Immunochromatography – Pen side tests

POSITIVE SAMPLE

NEGATIVE SAMPLE

OIE Twinning project

BETWEEN

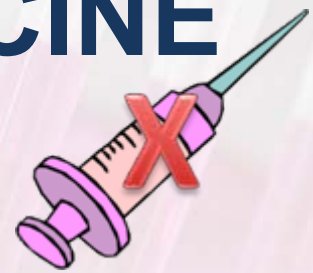
Universidad Complutense de Madrid (UCM) - OIE Reference laboratory for ASF (OIE-UCM-ASF)

and

National Research Institute for Veterinary Virology and Microbiology (NRIVVaM)


ВЕТЕРИНАРНОЙ
МИКРОБИОЛОГИИ

ASF PROTECTION: NO VACCINE



- NO INACTIVATED VACCINE
- ATENUATED VACCINE. NO SAFE AND ONLY PARTIAL PROTECTION in HOMOLOGOUS (CARRIERS & CRONIC F)
- NO RECOMBINAT VACCINE: NO good candidates
- NO DNA: Some Candidates
- NO

ANTIBODIES ARE RELATED WITH SOME TYPE OF PROTECTION AS WELL AS WITH CHRONIC AND ENDEMIC ASF INFECTION

Eradication without vaccine is possible but not easy.
Endemics:Portugaland Spain.
No Endemics countries: Brazil…

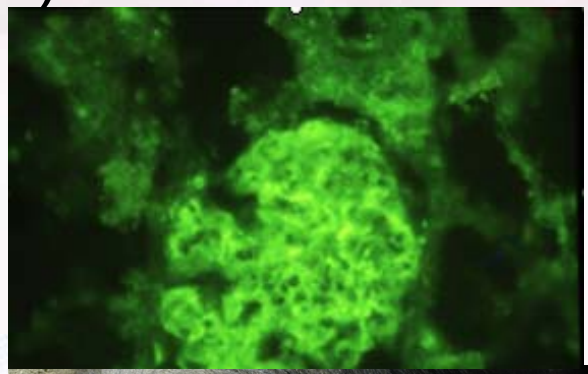
PROBLEMS OF ATENUATED ASF VACCINE UNTIL NOW:

LIMITED FIELD STUDIES: PORTUGAL and SPAIN 60s-70s
EXPERIMENTAL RESULTS: SEVERAL AUTHORS

A) **Release of infected virus**: Low virulence strains, Chronic forms ?. Carriers (Portugal, Spain 70s)

B) **No sufficiently attenuated**

C) **Only Homologous virus protection**.



ASF IMMUNE RESPONSES INVOLVED IN PROTECTION

POOR UNDERSTOOD:

- PROTECTIVE IMMUNITY **AGAINST HOMOLOGOUS** VIRUS (VIRUS IN LINPHO NODES)
- THE MAIN DIFFICULTY. **LACK OF NEUTRALIZING Ab and high genetic variability**
- Ab **PARTIAL PROTECTION**. DELAY IN THE ONSET C. SIGNS
- IMPORTANCE ROLE OF **NK AND CD 8**. DESTROYED I. M
- SOME TYPE OF PROTECCION **(Ab and CMI)** OCCURS

EARLY DETECTION

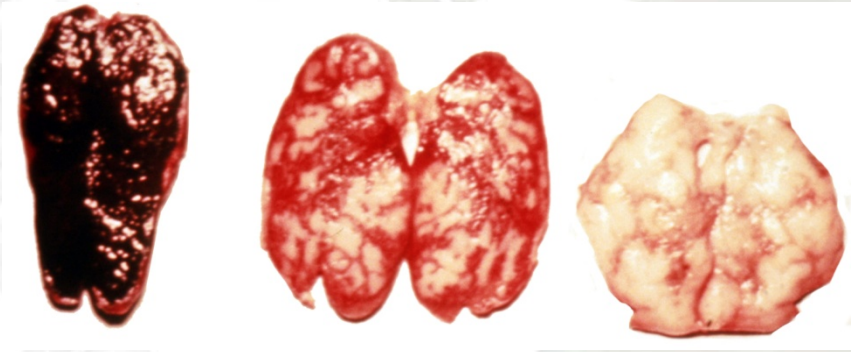
CONTROL AND ERADICATION

THE CHALLENGE

ARE WE AWARE ?

ARE WE MOTIVATED ?

ASF EARLY DETECTION NEEDED:

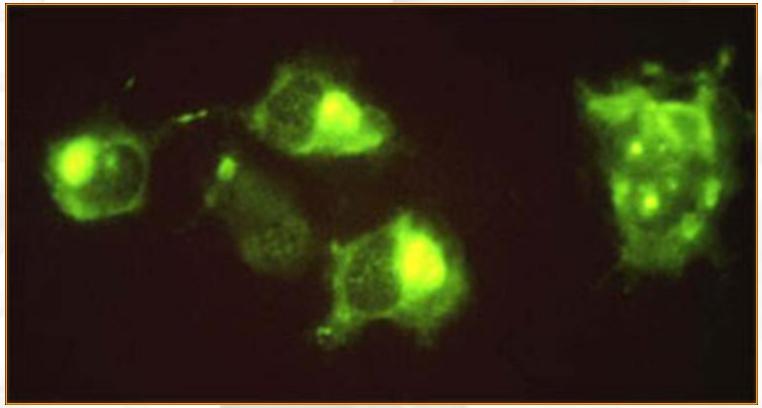


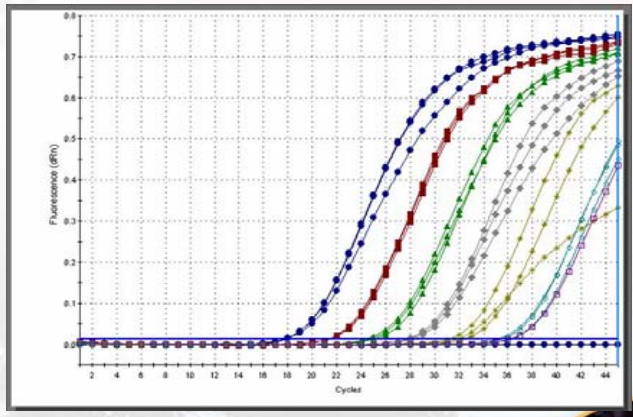
FIELD:

- Risk information
- ASF Information

LABs:

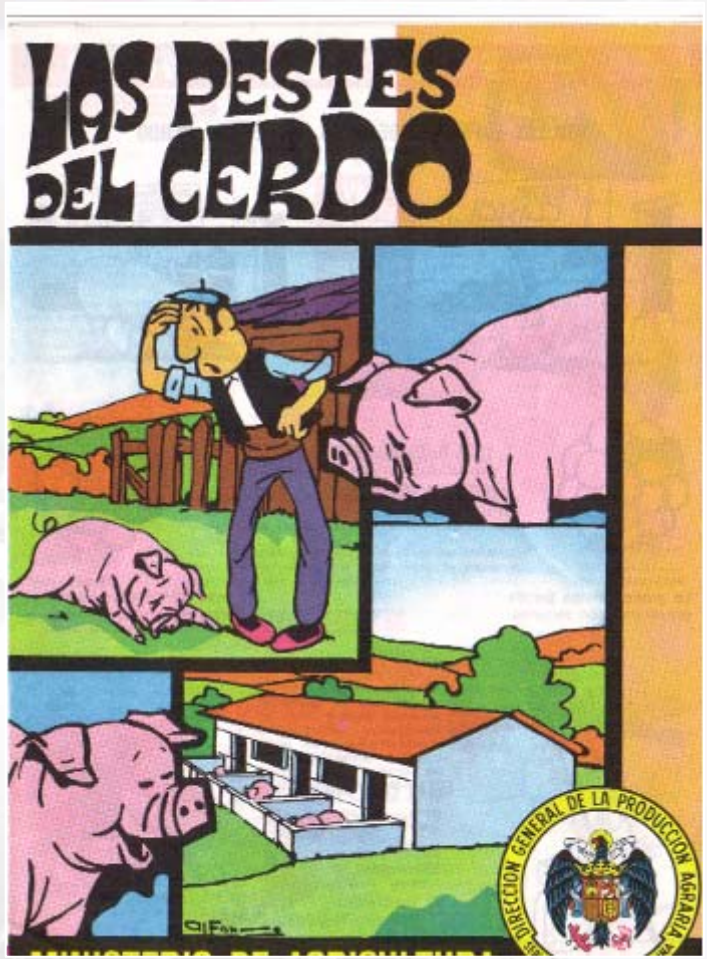
- Good conection with field
- Good test and procedure





TRAINING: FIELD AND LABORATORY

THE SPANISH MODEL



1960 - 1995

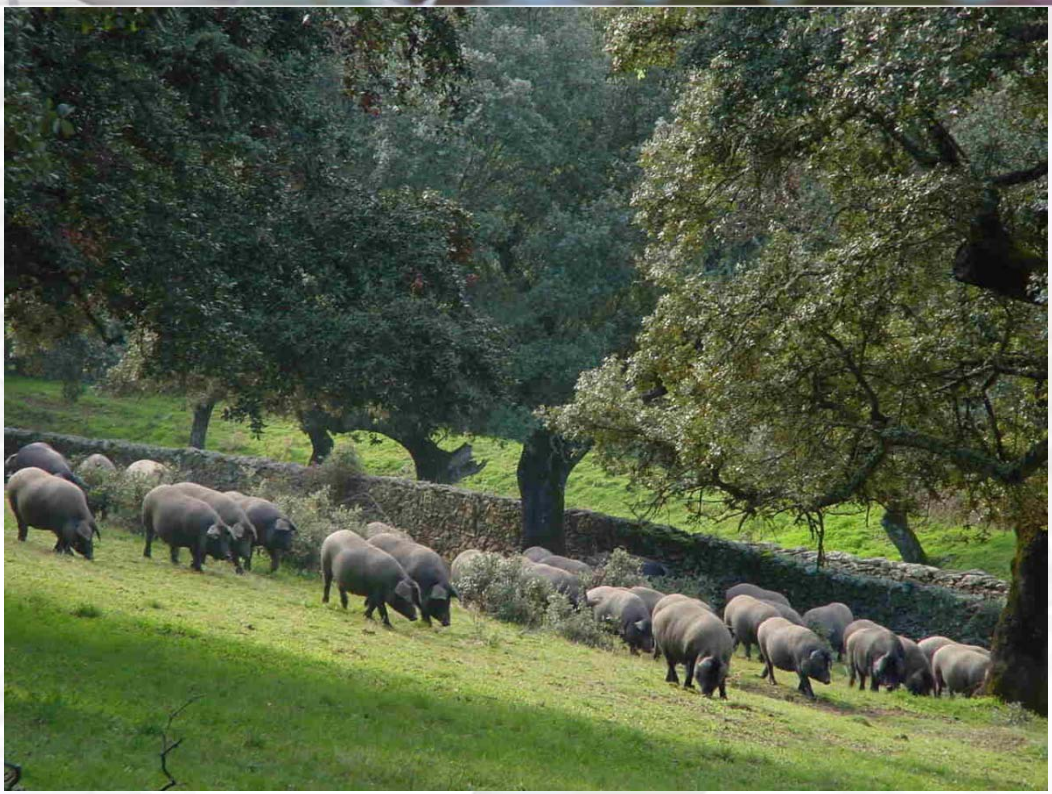
Spanish History
&
Epidemiological situation

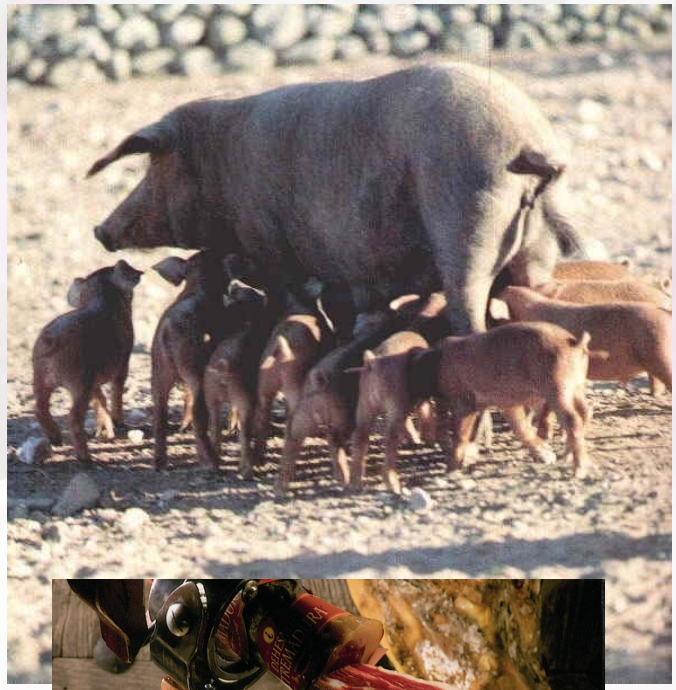
ASF appeared in Spain in 1960

- ✓ Spread within a undeveloped livestock sector
- ✓ 60s: Spanish economy began to take off
- ✓ In a few years, from back yard to intensive pig productions systems

TODAY SPAIN IS THE 2º EU

Swine Production System





Swine Sector in the 60s

Kgrs/person/year: 8

CENSUS: 6.032.000

PRODUCTION: 258.000 Tm

ASF AFFECTED AREA 60s

Swine Sector in the 1986

Kgrs/person/year: 33

CENSUS: 13.386.000

PRODUCTION: 1.167.000 Tm

OPEN BORDER FOR IMPORTATION

WE CAN NOT EXPORTATTION

COORDINATED PROGRAM

MOTIVATION

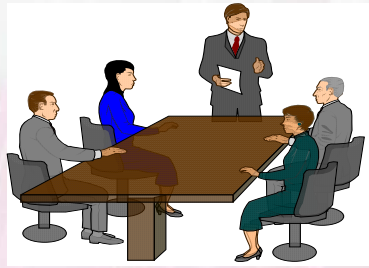
ASF. Spain: 1985-1995

IN DOOR

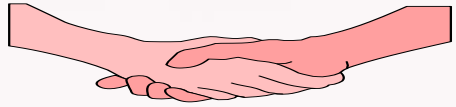
ERRADICACIÓN

ERRADICACIÓN II

Key Actions



1) A COORDINATED ERADICATION PROGRAME
2) ALL AGREE WITH THE PROGRAME



3) GOOD INFORMATION OF RISKs
4) ECONOMICAL AND TECHENICAL TOOLS
5) COMPESATION TO FARMERS
6) MOTIVATION

PROGRAME Key

1. Network of mobile vets field teams (127 vets)
2. Serological surveillance of 100% of pig farms
3. Improvement in animal holding facilities
4. Elimination of all ASF outbreaks (stamping out)

1. Network of mobile vets field teams (127 vets)

- Sanitary control of holdings
- Animal identification
- Epidemiological surveys
- Samples collection
- Serological control at abattoirs
- Epidemiological investigations
- Promotions of *Sanitary Associations*

2. Serological surveillance of 100% of pig farms

Main needs:

- A simple, fast, accurate & specific diagnostic test (Indirect ELISA)
- A Reference Laboratory to harmonize the techniques
- A net of Regional Laboratories for serological surveillance (13 labs)

At the beginind:

- **Indirect ELISA** to screen samples
- **IFA** to confirm results

In the final stages:

- Our group developed and improved **ELISA** (new soluble Ag with all ASFV proteins) and a **Immunoblotting** assay as confirmatory instead of IFA

Consequences

- ✓ New ELISA: Better recognitions of carriers
- ✓ New Immunoblotting: Easier and more objective interpretation
- ✓ New Immunoblotting: Better recognition of weak positives

3. Improvement in animal holding facilities

- 1st objective: to improve sanitary barriers to prevent de spread of the disease
- Hygiene measures: fences, sanitary enclosures, safe disposal of manure…

For this purpose:

- Loans at low interest rate were offered
- More than 2175 holdings were improved (1985-95)

4. Elimination of all ASF outbreaks (stamping out)

- All pigs in infected herds immediately slaughtered
- Samples collection for virological & epidemiological investigations
- Immediate and adequate compensation to the pig producers

STAMPING OUT is:

- ✓ A resource-intensive method of eradication
- ✓ The most cost-effective method
- ✓ Allow countries to declare ASF free in the shortest

STAMPING OUT must be:

- ✓ Applied for a period long enough to eradicate
- ✓ Accompanied by public awareness campaigns

Procedures once outbreak identified (I):

✓ Depopulation by **slaugthering** all pigs in the affected herd

✓ Cleaning and **disinfection** of all facilities during 1 month after depopulation

✓ **Extermination** of insects and rodents

✓ Removal and **destruction** of all animal feed and animal products

✓ **Cleansing** of manure pits by 2% sodium hydroxide

✓ **Incineration** of straw bedding

Procedures once outbreak identified (II):

✓ **Sanitary zone** of a 3 and 10 Km

✓ **Movement of animals**, products, feed and waste into or out the sanitary zone were restricted

✓ **Movement of people** to and from the area were restricted

✓ After implementation measures were gradua[illegible] in
(although some specific were maintainedat least 3 mont[illegible]s)

❑ Protection zone

- ✓ 3 km radius
- ✓ All pigs of all herds serologicallly screened immediately after confirmation
- ✓ Movement prohibited for 30 days

❑ Surveillance zone

- ✓ 10 km radius
- ✓ Screening 30 days after cleaning & disinfection of infected holding
- ✓ Movement prohibited for 30 days

Transmission between herds
Special Attention !

- Biosafety and sanitary measures to avoid transmission between herds played an important role in the eradication

- Epidemiological surveys indicated that 84% in 1989 and 93% in 1990, neighbor contact as the most likely source of the new outbreaks

V- Livestock Movement & Animal Identification

❑ Movement of animals

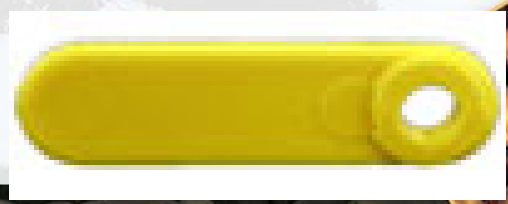
- ✓ Vehicles required to be washed and disinfected
- ✓ Animals in transit previously identified & provided with veterinary certificate (stating origin & sanitary situation)

❑ Abattoir

- ✓ Vets checking the sanitary certificate (before slaughtering)
- ✓ Life pigs inspected *antemortem* & tissues *posmortem*
- ✓ Sanitary certificates retained at least 1 year
- ✓ Manufacturers retained identification of meat origin

V- Livestock Movement & Animal Identification

- **Register & Identification**
  - ✓ Pig farmer census was improved & completed
  - ✓ Producers & manufacturers register was improved
  - ✓ Infected farms register was daily updated
  - ✓ Annual Report of the Program development issued



❑ Involvement and participation of farmers

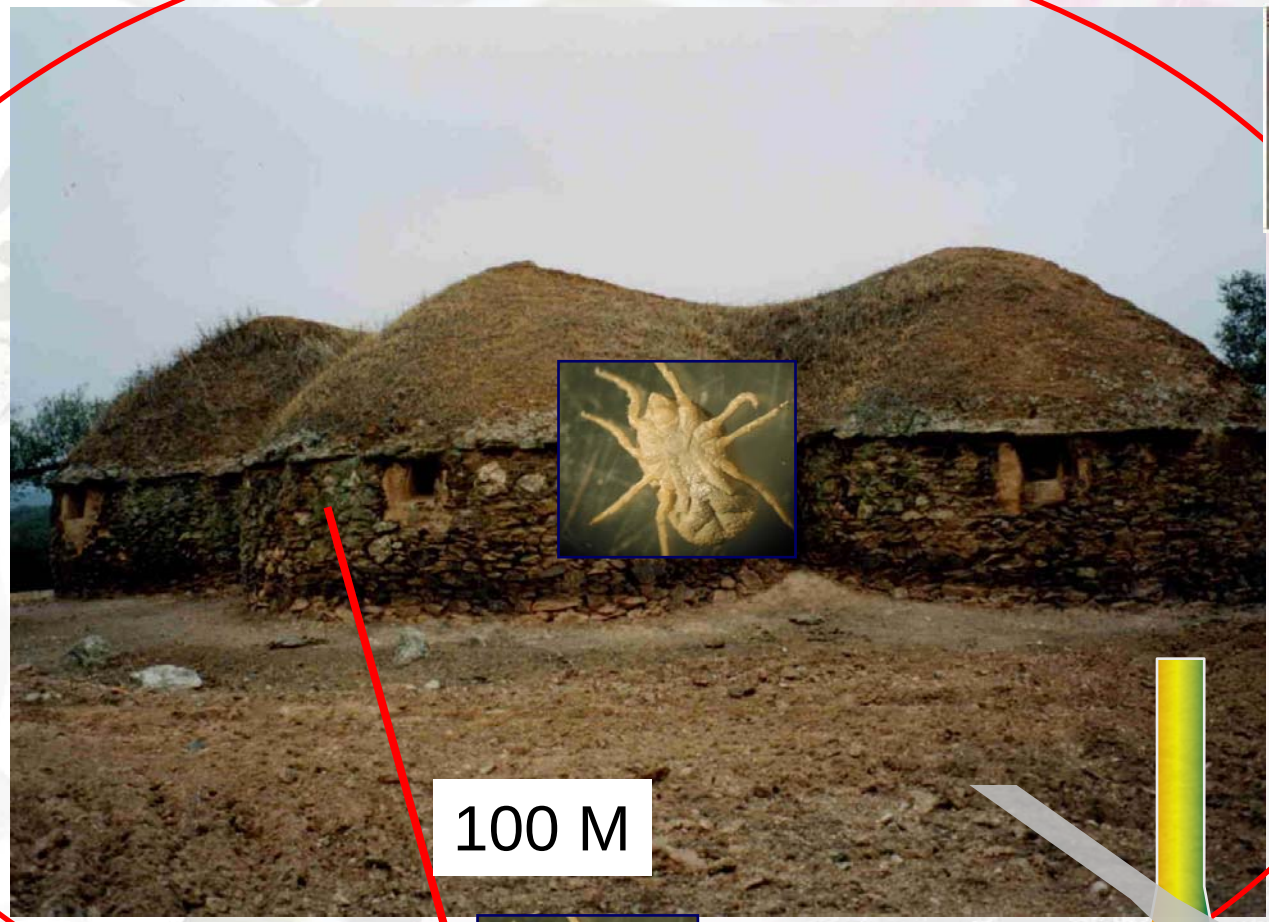
- ✓ Wide publicity campaign in the mass media
- ✓ Encouraging the creation of *Health Protection Group*
  - ➢ Lidership role in the eradication program (voluntary)
  - ➢ Common approach against ASF
  - ➢ Serological surveillance of breeders
  - ➢ Correct sanitary infrastructures
  - ➢ Sanitary suitable program for ASF
  - ➢ Aids from Administration
  - ➢ 1990: 1,000 HPG created grouping 41,500 farmers & 1m animals
  - ➢ A register was created classifying farms (health status & facilities)

VI- Regionalization

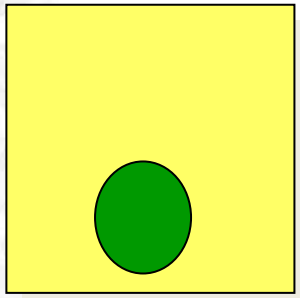
- **As a result of the progress…**
  - ✓ 1989 ECC authorizes dividing Spain into 2 regions:
    - ASF-free region (largest part of the country & 70% of pig population)
    - ASF-infected region

- ✓ Consequently prohibition of trade wa
  (from ASF- free regions)

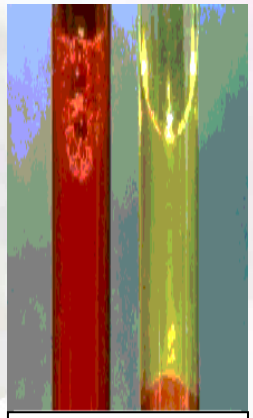
TWO MAIN PROBLEMS


100 M

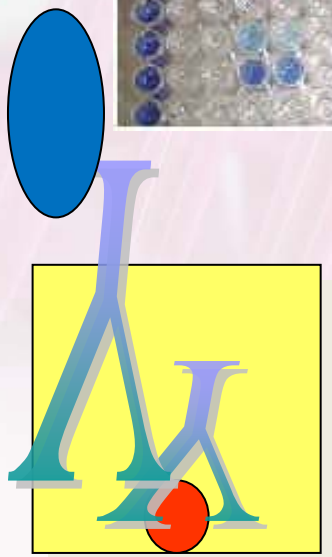
ELISA for O.E)

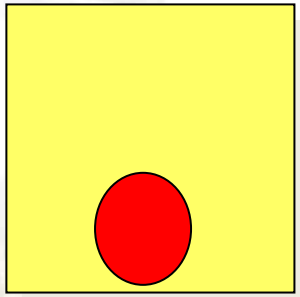


Soluble Salivar Gland of O.E

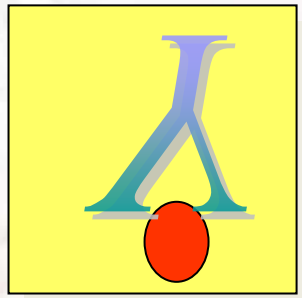


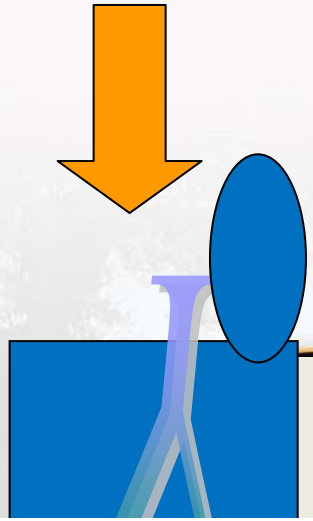
Serum ?





Asf Ag (Vp 73



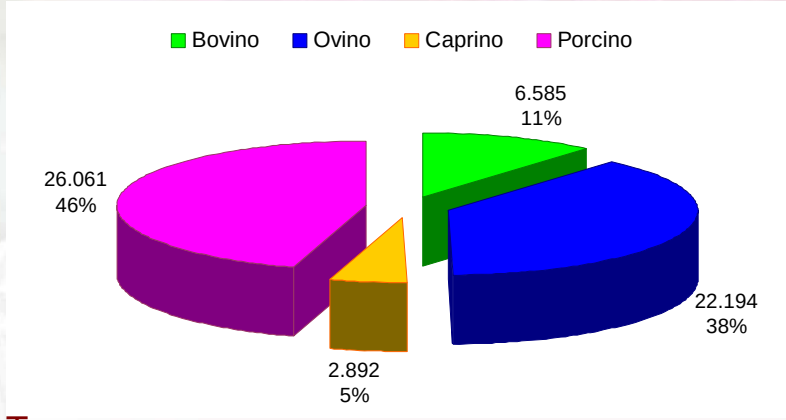


Canals A.; Oleaga A.; Pérez R.; Domínguez J.; Encinas A.; Sánchez-Vizcaíno J.M. (1990).). Veterinary Parasitology. 37, 145-153.

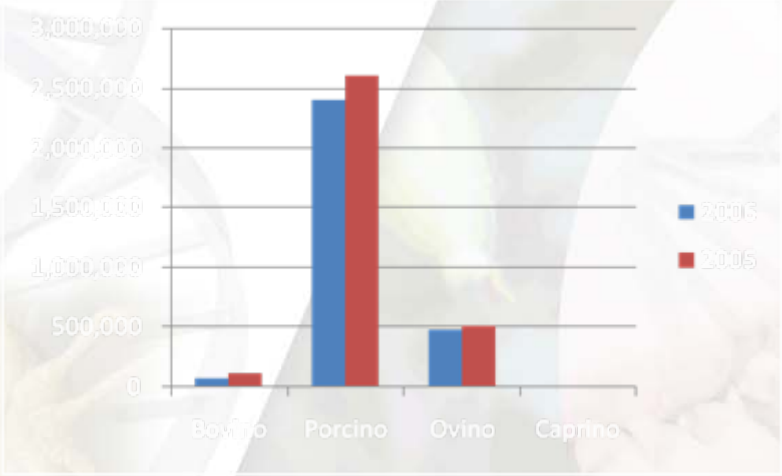
Swine Sector now

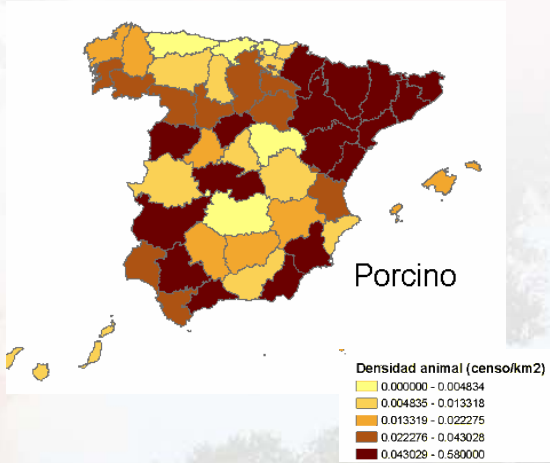
65 Kg/P/Y

- CENSUS:26.675.267
- 2º EU
- 33,5% PFG



Exportation in 2008 ;1.250.000 Tm





REAL INTEREST TO DO IT

The most importance tool

YOU CAN DO IT
Я ВСЕГДА С ВАМИ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