African swine fever
Activities and Future Program of FAO

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FAO Regional Office for Europe and Central Asia, Hungary

Inception workshop of the project
“African Swine Fever emergency preparedness in the Balkans”

Belgrade, Serbia, 18-21 February 2019

1908 International Institute of Agriculture (Rome)
1945 FAO established (Canada)
1951 FAO moves to Rome (IIA)
193 Member Countries (and EU)
Achieving food security for all is at the heart of FAO's efforts – to make sure people have regular access to enough high-quality food to lead active, healthy lives.

Our mandate is to improve nutrition, increase agricultural productivity, raise the standard of living in rural populations and contribute to global economic growth.

FAO's vision
A world free from hunger and malnutrition

Larger Frameworks

1. Eliminate hunger, food insecurity, malnutrition
2. Make agriculture more productive and sustainable
3. Reduce rural poverty
4. Enable inclusive and efficient agricultural and food systems
5. Resilience to disasters

UN Sustainable Development Goals 2030
HQ and Regional Offices

sub-Regional Offices
Overall collaborative framework

Global leader for food and agriculture
Global leader for animal health and welfare standards
Global leader for human health

Tripartite agreement
Collaborations
Joint priorities since 2010, including AMR, Rabies and Zoonotic Influenza

FAO-OIE-WHO
Global Early Warning System (GLEWS)
FAO Vision for the control of TADs

- Close monitoring (EMPRES-i)
- Regional Approach - Regional response plan
- Risk assessment for at risk countries
- Information sharing: lessons learnt and best practices
- Foster cooperation of all stakeholders: farmers, traders, processors, veterinarians, etc.
- Raising awareness
- Harmonization of vaccination protocols and other preventive and control measures
- Piloting new approaches for risk mitigation and outbreak control
<table>
<thead>
<tr>
<th>Activity Description</th>
<th>Funding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emergency Assistance for the Control of ASF</td>
<td>$ 436,865</td>
</tr>
<tr>
<td>Emergency Assistance for the Control of ASF - Phase II of TCP/ARM/3102</td>
<td>$ 66,685</td>
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<tr>
<td>Assessment of ASF situation</td>
<td>$ 8,344</td>
</tr>
<tr>
<td>Assistance for the Eradication of ASF</td>
<td>$ 21,000</td>
</tr>
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<td>Support to the Eradication of ASF</td>
<td>$ 135,000</td>
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<tr>
<td>Assessment of ASF situation</td>
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<td>$ 135,000</td>
</tr>
<tr>
<td>Emergency assistance to control the ASF outbreak in Belarus</td>
<td>$ 430,000</td>
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<tr>
<td>Developing Prevention and Control Strategies for ASF in China</td>
<td>$ 380,000</td>
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<tr>
<td>Emergency assistance to control the ASF outbreak in Belarus</td>
<td>$ 420,000</td>
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<td>Emergency assistance to control the ASF outbreak in Belarus</td>
<td>$ 80,000</td>
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<td>$ 256,000</td>
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<td>Emergency assistance to control the ASF outbreak in Belarus</td>
<td>$ 265,284</td>
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<td>Emergency assistance to control the ASF outbreak in Belarus</td>
<td>$ 160,000</td>
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<tr>
<td>Emergency assistance to control the ASF outbreak in Belarus</td>
<td>$ 80,000</td>
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<td>Emergency assistance to control the ASF outbreak in Belarus</td>
<td>$ 256,000</td>
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<td>Emergency assistance to control the ASF outbreak in Belarus</td>
<td>$ 212,000</td>
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<tr>
<td>Finalization of the Regional Strategy and development of a Regional Control Program for ASF in Africa</td>
<td>$ 112,000</td>
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<td>Enhancing Prevention Capacities for Emergency Intervention Against ASF in W. Africa</td>
<td>$ 386,695</td>
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<tr>
<td>Training in Laboratory Diagnosis of ASF</td>
<td>$ 20,012</td>
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<tr>
<td>Emergency Assistance to Control ASF Outbreak</td>
<td>$ 343,072</td>
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<tr>
<td>Capacity development in early detection and response to ASF in Ukraine</td>
<td>$ 258,000</td>
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<tr>
<td>Control of Transboundary Animal Diseases in Africa and a Global Alliance to Combat ASF</td>
<td>$ 308,949</td>
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<tr>
<td>Control of Transboundary Animal Diseases in Africa and a Global Alliance to Combat ASF - FAO-USD collaboration in ASF control and prevention</td>
<td>$ 421,000</td>
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<tr>
<td>Targeted research effort on ASF</td>
<td>$ 109,522</td>
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<tr>
<td>Prevention of ASF and Other Diseases</td>
<td>$ 4,752,762</td>
</tr>
<tr>
<td>Eradication of ASF and Restocking Pig Farms</td>
<td>$ 772,460</td>
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</tbody>
</table>
Regional coordination

The ASF Global Platform - Launching

• 5-7 November 2013, Rome
• 51 participants:
  – By Region: Africa (9), America (9), Asia (3), and Europe (29)
  – By type of organization:
    • 7 Industry: Pig Multinationals, Pharmaceuticals, Farmer and Vet Associations;
    • 16 International: FAO, OIE, AU-IBAR, EC;
    • 11 National authorities: Belarus, China, Italy, Japan, Uganda, Cameroun, Russia, US
    • 15 Research: OIE/FAO and EU Ref Labs (CISA, FADDL, Pirbright and UCM), ILRI, VNIIVViM, SVA, IZSUM, IREC, FLI, FAZD, MSU, CIRAD, University of Pretoria
    • 1 NGO

• http://www.fao.org/docrep/019/i3739e/i3739e.pdf
**GARA - Global ASF Research Alliance**

- Launched April 2013
- **Mission:** To establish and sustain global research partnerships that will generate scientific knowledge and tools to contribute to the successful prevention, control and where feasible, eradication of ASF
- Technical groups: Virology/Immunology, Vaccines, Diagnosis, Epidemiology
- Open membership
- 3 meetings so far:
  - March 2013, Plum Island, USA
  - November 2014, Pretoria, RSA
  - September 2016, Ploufragan, France
  - April 2018, Cagliari, Italy
- Updates and gap analysis (2018)

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**Ad hoc meetings**

- 3-4 Feb 2011, EU-FMD & GFTADs, Budapest, Hungary: 1st Veterinary Forum for South East Europe
- 21-23 Mar 2011, Kyiv, Ukraine: Cross-border cooperation between veterinary services (Russian Federation and Ukraine) for ASF control and prevention
- 4-5 Dec 2012, Budapest, Hungary: Threat of ASF spread in Eastern Europe: Urgent need for international collaboration under GF-TADs Europe

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- 22-23 November 2018, Beijing, China: Swine Fever Emergency Preparedness Workshop China, Laos, Myanmar and Viet Nam
Standing Group of Experts on ASF in the Baltic and Eastern Europe Region (SGE ASF)

- Set up under the GF-TADs to build up a closer cooperation
- Comprises decision makers, experts, EC, OIE and FAO
- Main objective is to strengthen mid-term regional cooperation through:
  - Regular exchange of information on ASF situation and control measures
  - Regular review of national control strategies by experts with a view to harmonizing control policies and building a regional control strategy
  - Collaboration on laboratory diagnostics
  - Collaboration on awareness raising campaigns in the affected countries
- Meet every few months (depending on the situation):

Rapid response missions – Emergency Management Center for Animal Health

Provide **Rapid response** to transboundary animal diseases (TADs) and emerging animal disease (EIDs) threats

**When EMC deploys**
- Newly infected country
- Country at high risk of infection
- Country affected by significant epidemiologic change
  - Upon government request
84 missions in 45 countries
(approx. 46% HPAI, 20% Zoonoses and 34% other TADs)

October 2006 – September 2016

FAO Rapid Assessment missions on ASF

- EMC rapid missions
  - Joint FAO/OIE/EC to Georgia (June 2007)
  - Joint FAO/OIE/EC to Armenia (September 2007)
  - FAO/OIE to Belarus (May 2010)
  - FAO/OIE to Tanzania (November 2011)
  - FAO to Côte d'Ivoire (October 2014)
  - FAO to Mongolia (February 2019)
  - FAO to Myanmar (February 2019)

- Non-EMC assessment missions
  - EMPRES assessment mission to Ukraine (July 2010)
  - DPRK (January 2019)
Development projects

Current state FAO response

ASF Projects Africa:
• Regional project West Africa (donor- Ireland 300,000 USD)
• TCP Ivory Coast (300,000 USD)

ASF projects Europe:
• Regional TCP project Western Balkans (500,000 USD)
• TCI FAO/EBRD Ukraine (till May 2019)

ASF projects for South East Asia:
• Regional project South East Asia (500,000 USD)

Finalized Projects: TCPs: Georgia, Armenia, China, Ukraine, Belarus, Moldova (TCPf)

- Improving (national & sub-national) contingency plans & Simex
- Strengthening lab diagnostic capacity
- Improving knowledge/awareness of local vets
- Raising ASF awareness of farmers
- Training for mass media experts
- Enhancing ASF surveillance capacity locally
- Strengthening private sector resilience to ASF-related risks

Capacity building
Past ad-hoc capacity building efforts

- **Epidemiology Trainings**: Ukraine: (May 2009; > 50 participants); and Belarus (May 2009; > 20 participants)
- **Lab Trainings**: Ukraine (March 2010; 16 diagnosticians from Belarus, Moldova and Ukraine); and Kazakhstan (with CISA-INIA; Sept 2013; 10 participants)
- **Collection & identification of Ornithodoros ticks**: Georgia, June 2013 (with CIRAD): 10 participants from Georgia (2), Armenia (1), Kazakhstan (1), Russia (2), Bulgaria (2), and Ukraine (1)
- **Epi & Diagnosis**: Italy, Nov 2013 (with IZS-UM): 9 participants from Georgia (1), Armenia (2), Belarus (2), Russia (1), Moldova (1), Ukraine (2) and Serbia (1)
- **Contribute to EC’s BTSF GF-TADS workshops**

Training on ASF management in wild boar

- Kaunas, Vilnius, 22-23 Nov 2017
- Participants: Belarus, Moldova, Ukraine, Bulgaria, Estonia, Germany, Hungary, Latvia and Lithuania, FAO, OIE, DG SANTE, and FACE
- Day 1 - Technical presentations
- Day 2 - Field day at a hunting ground.
Dissemination, awareness & early warning

Early warnings and assessments:

• 2007 - ASF in Georgia
• 2008 - ASF in the Caucasus
• 2009 - ASF spread in the Russian Federation and the risk for the region
• 2010 - FAO takes a close look at the threat of ASF introduction into Eastern Europe
• 2012 - ASF recent developments - timely updates
• 2013 - ASF in the Russian Federation: risk factors for Europe and beyond
• 2018 - African Swine Fever threatens People's Republic of China
EMPRES-i
FAO’s Animal Health Database

Early warnings & awareness raising

1. Weekly updates on the ASF situation in Asia
2. AGAH/EMPRES web-site – ASF Portal
3. Alerts on ASF, e.g. Chinese New Year
4. Email distribution list (ASF & LSD) daniel.beltran.alcrudo@fao.org
5. Other:
   1. ASF Portal - 29th issue of the quarterly Food Chain Crisis Early Warning Bulletin
   2. Early Warning Early Action report on food security and agriculture
## Awareness materials

- Fully editable format (PowerPoint) that allows to quickly adapt, translate, add logos, change pictures, etc. when faced with an animal health emergency.
- Dynamic list of languages
- Additional languages and formats (e.g. posters and videos) will be uploaded as they become available.

### What can hunters do to prevent the spread of the disease?

<table>
<thead>
<tr>
<th>What can hunters do to prevent the spread of the disease?</th>
</tr>
</thead>
<tbody>
<tr>
<td>In at risk areas, hunters should look out for dead or sick wild boar and notify immediately to [ENTER TELEPHONE NUMBER]. Each dead wild boar should be reported and ASF ruled out by laboratory diagnostic tests.</td>
</tr>
<tr>
<td><strong>In affected areas</strong>, wild boar products, leftovers and trophies pose a significant risk of being infected. This is why all hunters are required to place particular emphasis on hygiene measures when hunting in affected areas:</td>
</tr>
<tr>
<td>- Do not leave any leftovers from the hunted wild boar in the forest.</td>
</tr>
<tr>
<td>- Avoid getting in contact with pigs after hunting a wild boar.</td>
</tr>
<tr>
<td>- Ensure that the clothes worn, tools and equipment used (e.g. knives, car) that may be contaminated by blood while hunting are cleaned and disinfected and don’t get in contact with pigs.</td>
</tr>
</tbody>
</table>

### What should people who raise pigs do to protect their pigs?

- Leftovers fed to pigs that may contain meat (i.e. swill feeding) should be boiled before.
- If you notice any clinical signs, including sudden death in your pigs, you should immediately report it to the [ENTER OFFICIAL NAME OF VETERINARY SERVICES].
- Pigs should be kept indoors all the time, not allowing them to comingle with other pigs or wild boar.
- Buy your pigs from a trusted source and keep them separated from your animals during two weeks (quarantine).
- Avoid unnecessary visitors getting in contact with your pigs.

### Is there a vaccine or treatment?

No. No effective treatment either.

### Bringing back meat products from other countries can result in the spread of the disease

To prevent the incursion of ASF and other animal diseases, do not bring back home meat or meat products from other countries, particularly those infected with ASF. Travelers should always make sure that food waste is only discarded in closely sealed waste containers where pigs and wild boar will have no access.

What is African Swine Fever (ASF)?

African swine fever (ASF) is a contagious viral disease of pigs and wild boar that causes severe economic losses to the pig sector. Originally restricted to Africa, it was introduced into Georgia in 2007, from where it spread westwards (reaching Eastern and Central Europe) and eastwards within Europe. The disease has now been reported in China, seriously threatening countries in East and Southeast Asia.

How is the disease transmitted?

Wild boar and pigs can infect each other by direct contact, particularly when blood is present. Healthy animals can also get infected when they consume undercooked pork products, either while scavenging or when fed uncooked swill. They can also become infected by feeding on infected pork or carcasses, or through contaminated tools and equipment (clothes, needles, vehicles, etc.).

Which animals can be affected?

The ASF virus exclusively infects suids, e.g. pigs and wild boar.

Can humans be infected with the virus?

No.

What causes ASF?

The disease is caused by a virus that is very resistant and can survive for long periods, even months, in feces, meat products (frozen, salted and smoked or undercooked), and carcasses of dead animals. The virus, however, can be killed with several disinfectants such as 1% formaldehyde, 2% NaOH or paraphenylphenolic disinfectants.

What are the clinical signs of the disease?

Infection can cause a wide range of clinical signs. Sick pigs usually die. In the backyard sector, pigs show a lack of appetite followed by sudden death. Rarely other clinical signs are observed. In commercial farms, you may also see depression, weight loss, hemorrhages in the skin (tips of ears, tail, legs, chest and abdomen), lameness and abortion in pregnant sows. Clinical signs may be more difficult to see in wild boar because of their long dark hair. Bloody diarrhoea and distinct hyperaemic (red) areas on skin of neck, chest and extremities. Haemorrhagic lymph node. Enlarged spleen.

Manuals

- Good practices for biosecurity in the pig sector (EN, FR, SP, RU) http://www.fao.org/docrep/012/i1435e/i1435e00.pdf
- Preparation of ASF contingency plans (EN, FR, SP, RU, GEO, ARM) ftp://ftp.fao.org/docrep/fao/012/i1196e/i1196e00.pdf
- Recognizing ASF - A Field manual (EN, RU, CH, SR, LT) – Albanian and Macedonian http://www.fao.org/documents/card/en/c/bd35c569-752e-4b57-892e-e3e2e0ee0c9c/
Handbook on African Swine Fever in wild boar and biosecurity during hunting

- Technical, but practical
- Compendium of information about hunting management, biosecurity and wild boar carcass disposal
- Briefly describes range of practical management and biosecurity measures or interventions.
- Living document,
- Link

Research
Host population mapping/modelling

Wild boar
- Wild boar distribution range and densities
- Model now available for the whole of Europe and North Eurasia (5 km resolution)

Domestic pigs
- Low and high biosecurity sectors

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- Disaggregate and map wild boar population-density statistics to produce high resolution maps
- From spatially heterogeneous administrative units (polygons) to high resolution raster maps (5 km)
Materials: WB data and predictors

- **WB data**: average density for suitable area by admin unit
  - WB counts/harvest data (n = 504 sub units)
  - Timeframe: 2005-2010
  - IUCN WB range to mask out unsuitable areas

- **Predictors**: Average bioclimatic and environmental variables for suitable habitat by admin unit
  - 18 bioclimatic variables (Worldclim)
  - 3 continuous vegetation cover
  - topography (elevation and slope)

Methods: flowchart of the novel approach
Conclusions

- Highly accurate wild boar predicted densities, both against original input data and independent data (Melis et al. 2006)
- The map can be a useful tool for decision makers, dealing with risk assessment, WB management, epi, surveillance, prevention and control
Density of pigs in low biosecurity farms
Pig sector studies

Surveys to 487 farmers and 116 butchers

The Pig Sector

- Highly variable
- Highly seasonal
- Almost 100% backyard (non-professional)
- Predominant home-slaughtering
- Many unknowns


Questionnaires for both farmers and butchers

Contents: biosecurity, husbandry, market chains, awareness, socioeconomic aspects, wild boar

<table>
<thead>
<tr>
<th>Region</th>
<th>Villages</th>
<th>Farmers</th>
<th>Butchers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kakheti</td>
<td>42</td>
<td>120</td>
<td>30</td>
</tr>
<tr>
<td>Samegrelo Zemo-Svaneti</td>
<td>47</td>
<td>122</td>
<td>31</td>
</tr>
<tr>
<td>Samtskhe Javakheti</td>
<td>37</td>
<td>125</td>
<td>25</td>
</tr>
<tr>
<td>Shida Kartli</td>
<td>43</td>
<td>120</td>
<td>30</td>
</tr>
<tr>
<td><strong>Grand Total</strong></td>
<td><strong>168</strong></td>
<td><strong>487</strong></td>
<td><strong>116</strong></td>
</tr>
</tbody>
</table>

Response rate:
• pig keepers - 30/41 questions had a response rate over 95%
• butchers - 22/24 questions had a response rate over 95%
Data analysis

• Descriptive statistics
• Two factorial analyses of mixed data (FAMD) - to study the relationship among collected variables
• Hierarchical clustering on principal components (HCPC) - to identify clusters of individuals
• Social network analysis and exponential random graph models - to understand structure, contact patterns and main drivers for pig trade in the country

Main findings

• Five major production/husbandry strategies (which match the four study regions)
• Main characteristics:
  – Secondary income
  – High within-country variability and seasonality
  – Not professional
• Main biosecurity gaps at farm level:
  – Scavenging, i.e. Highest scavenging → Highest # of outbreaks
  – Swill feeding
  – Reproductive management
  – No apparent major connection to wild boar
• Key social network knots identified: Live animal markets and middlemen
Conclusions - Recommendations

• Need to better educate and raise awareness of disease transmission and outbreak management policy
• Main biosecurity gaps can be targeted through training, awareness and sector development programs
• Live animal markets and middlemen can be targeted for disease interventions, e.g. surveillance, awareness, training and financial compensation)
• However, these systems are difficult to change, since they go deep into the traditions and roots of the communities and allow the production of pigs with minimum investments

IAEA Coordinated Research Project (CRP) for Early and Rapid Diagnosis and Control of ASF

• 2014-2019 (1st Meeting on 7-11 July 2014, Vienna, Austria)
• Participating countries:
  – Burkina Faso, Cameroon, China, Côte d'Ivoire, Germany, Nigeria, Russian Federation, Senegal, Uganda, Zambia
• Topics covered:
  – Serology
  – Molecular diagnostics
  – Epidemiology and sequencing
  – Immunization and Immunology
FAO, EU and OIE Reference laboratories/ centres in ASF

- ARC-OVI (Agricultural Research Council, Onderstepoort Veterinary Institute), South Africa
  - FAO and OIE
- CISA-INIA (Centro de Investigación en Sanidad Animal - Istituto national de investigación y tecnologia agraria y alimentaria), Spain
  - FAO and EU
- Pirbright Institute, UK
  - OIE
- UCM (Universidad Complutense de Madrid), Spain
  - OIE

Thanks for your attention