Experience on epidemiological analysis and difficulties encountered in Poland

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Workshop on „Harmonisation of data collection on African swine fever (ASF) virus in Baltic States (Estonia, Latvia and Lithuania) and Poland, EFSA, Parma, 23-25.11.2015
Comparison of WB density: 2014 & 2015 census
Density of pig population in Poland (2014)
Epidemiological situation

**Cases of ASF in wild boar**
- First case of ASF was confirmed on 17 February 2014
- Since that time 77 cases in WB have been confirmed (30 cases in 2014 and 47 in 2015);

**Outbreaks of ASF in domestic pigs**
- 1\(^{st}\) outbreak – 23 July 2014
- 2\(^{nd}\) outbreak - 8 August 2014
- 3\(^{rd}\) outbreak – 31 January 2015
Evolution of areas under various restrictions

Source: M. Popiołek, GVI Warsaw
Currently applicable areas under various restrictions in accordance with Commission Implementing Decision 2014/709/EU *(the most recent amendment in Decision (EU) 2015/1783)*

- Part I of Annex to decision 2014/709/EU
- Part II of Annex to decision 2014/709/EU
- Part III of Annex to decision 2014/709/EU

Source: M. Popiołek, GVI Warsaw
Be careful about the colours!

Old habits die hard…
Pig population in Part I, II, and III zones (as of 30 Sep 2015) – source of data: GVI Warsaw

- **Part I**: 205,500 pigs in 3,172 holdings
- **Part II**: 21,370 pigs in 827 holdings
- **Part III**: 279 pigs in 65 holdings
Wild boar population in Part I, II, and III zones (as of March 2015) – source of data: National Forestry

- **Part I:** 5000
- **Part II:** 2800
- **Part III:** 1700
Immunoblotting techniques

Confirmatory tests

PPA Ingezim Compact 11.PPA.K3, Ingenasa

Real-time PCR with UPL probes

Immunoperoxidase assay
Diversity of samples tested for ASFV

Source: E. Kozak
## ASF surveillance in Poland: Jan 2014 – Nov 2015

<table>
<thead>
<tr>
<th>Tests</th>
<th>Domestic Pig</th>
<th></th>
<th>Wild Boar</th>
<th></th>
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<tbody>
<tr>
<td></td>
<td>samples</td>
<td>results</td>
<td>samples</td>
<td>results</td>
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<tr>
<td>PCR</td>
<td>36.090</td>
<td>11</td>
<td>24.056</td>
<td>127</td>
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<tr>
<td>serological</td>
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<td>0</td>
<td>10.622</td>
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<tr>
<td>Total number of</td>
<td>&gt;36 000</td>
<td>11</td>
<td>&gt;24 000</td>
<td>132</td>
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<tr>
<td>examined animals</td>
<td></td>
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</tbody>
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Active vs. passive surveillance (part I, II and III zones) February 2014 – August 2015

Seasonality (1 year included in the analysis)

- the only statistically significant difference was between Summer and Autumn in passive surveillance
Phylogenetic analysis

- primers specific to MGF505-2R
- expected product length 1173 bp

- all genotype II

- vast majority undistinguishable from Georgia/2007 and Odintsovo/2014

- Some level of genetic diversity: Evidence for repeated introductions?

- difference between ASFV responsible for outbreaks in pigs (no direct link between outbreaks)
Difficulties encountered

• understanding unique epidemiological features of ASF in the region
  - why is ASF spreading so slowly?
  - why is it entrenched in a small region for such a long time?
Suggested explanation

• low frequency of contacts between WB from different social groups (evidence-based) -> slow spread, relatively small proportion of WB population affected
  - High infectivity
  - Low contagiousness
  - High virulence
  - High case fatality rate
  - Low mortality rate

• high resistance of the virus – carcasses can be contaminated for weeks (months?) in temperate climate (e.g. Poland), and thus creating long-lasting source of infection
• introductions from affected country(ies)
• density of wild boar in the infected area enables sustained maintenance of ASF? What threshold?
• frequency of contacts with WB carcasses?
All cases in the areas with >1 individual/km²
Difficulties encountered

Diagnosis:

- PCR -, serology +:
  - interpretation: based on current approach – positive case

- quality of blood samples from WB: misinterpretation possible
- disproportionate number ELISA-positive not confirmed by IPT (extensive validation in WB needed)

- Pig owners are obliged to implement stringent biosecurity measures or terminate production.
- If they decide to continue but not comply with the rules – culling of the pigs (compensations) + prohibition to keep the pigs until 2018.
- If they decide to terminate production: compensations and reimbursement for 3 years.
Thank You

Acknowledgements:
G. Wozniakowski
L. Bocian
E. Kozak
T. Podgórski
Z. Pejsak