National Food and Veterinary Risk Assessment Institute

Lithuanian University of Health Sciences

AFRICAN SWINE FEVER IN WILD BOAR IN LITHUANIA

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ASF management in wild boar, 22 November 2017 LUHS, Kaunas

ASFV was first detected in wild boars in January 2014

ASF virus infection in wild boars on the end of 2014:

45 places (22 hunted, 54 dead wild boars)

OUTBREAKS OF ASF IN WILD BOAR IN 2014-2016

2014: 76 wild boar in 45 places (22 hunted, 54 dead)

2015: 132 wild boar in 111 places (73 hunted, 59 dead)

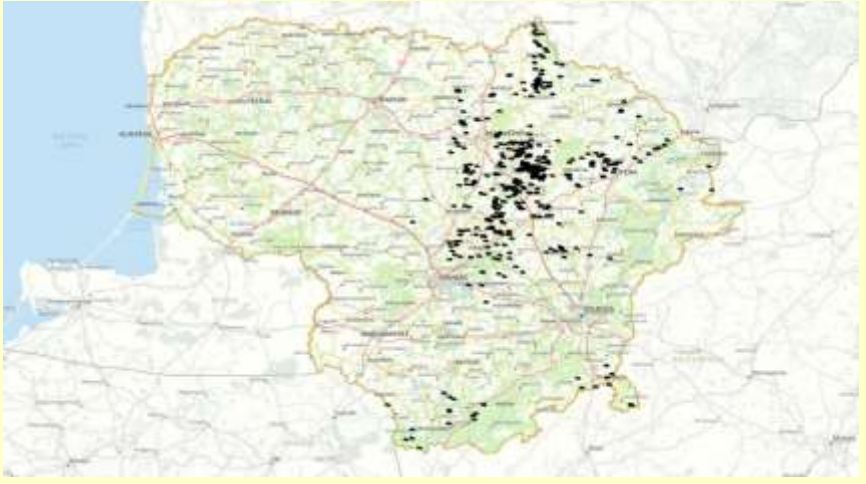
2016:478 wild boar in 303 places (99 hunted, 379 dead)

OUTBREAKS OF ASF IN WILD BOAR IN MAY 2017:

387 wild boar in 171 places (34 hunted, 353 dead)

OUTBREAKS OF ASF IN WILD BOAR IN SPETEMBER 2017:

931 wild boar in 515 places (92 hunted, 839 dead)



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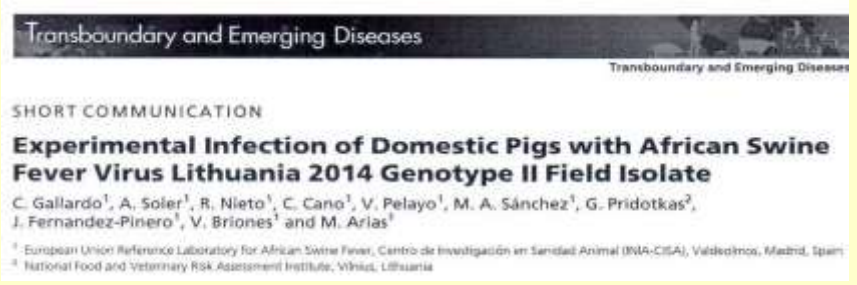
Lithuanian ASFV isolated from wild boars 2014 induced an acute disease in pigs which resulted in 94.5% mortality


Transboundary and Emerging Diseases

Transboundary and Emerging Diseases

SHORT COMMUNICATION

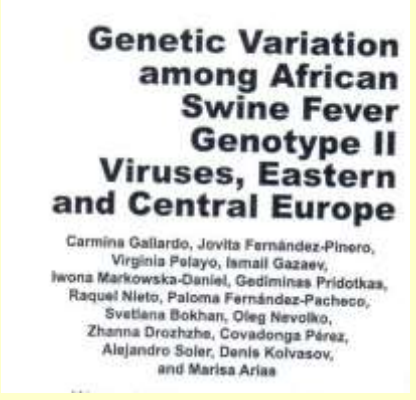
Experimental Infection of Domestic Pigs with African Swine Fever Virus Lithuania 2014 Genotype II Field Isolate

C. Gallardo[1], A. Soler[1], R. Nieto[1], C. Cano[1], V. Pelayo[1], M. A. Sánchez[1], G. Pridotkas[2], J. Fernandez-Pinero[1], V. Briones[1] and M. Arias[1]

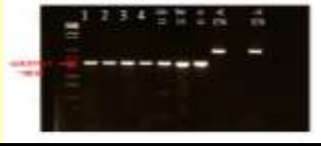
[1] European Union Reference Laboratory for African Swine Fever, Centro de Investigación en Sanidad Animal (INIA-CISA), Valdeolmos, Madrid, Spain
[2] National Food and Veterinary Risk Assessment Institute, Vilnius, Lithuania

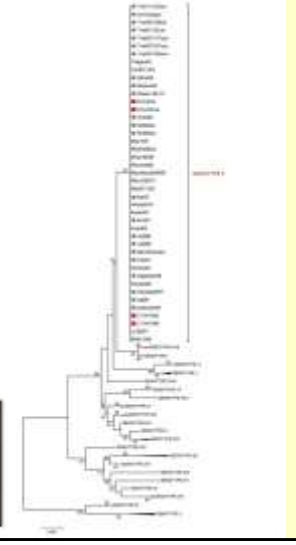
- **The ASFV was easily detected by PCR in blood samples prior to the appearance of the clinical signs and from the tested organs at necropsy**
- **ASF antibodies were detected in 33% of the pigs at 17-18 days post-exposure**

Lithuanian and Polish ASF viruses (LT14/1482, LT14/1490, Pol14/Sz, Pol14/Krus) from wild boars were clustered within p72 genotype II showing 100% identity at nucleotide level to all East European ASFV isolates II


Genetic Variation among African Swine Fever Genotype II Viruses, Eastern and Central Europe

Carmina Gallardo, Jovita Fernández-Pinero, Virginia Pelayo, Ismail Gazaev, Iwona Markowska-Daniel, Gediminas Pridotkas, Raquel Nieto, Paloma Fernández-Pacheco, Svetlana Bokhan, Oleg Nevolko, Zhanna Drozhzhe, Covadonga Pérez, Alejandro Soler, Denis Kolvasov, and Marisa Arias





Genetic Variation among ASF Genotype II Viruses in the intergenic region between the 173R and 1329 L genes (Gallardo et al. 2014)

- **Nucleotide sequence analysis of the PCR 356 bp products showed that the ASFV from Lithuania and Poland had tandem repeat sequence (TRS) insertions identical to ASFV isolates from Belarus and Ukraine**
- **There is a need to define new genetic markers to determine origin of ASF outbreak or evaluate variability among ASFV strains (isolates) circulating in EU**

Methods for ASFV testing in National Food and Veterinary Risk Assessment Institute:

- **For ASFV detection in tissues, blood, serum samples OIE TaqMan PCR is used**
- **For ASF antibody detection a commercially available blocking Ingenasa ELISA (VP72) and IDvet indirect screening ELISA (p32, p62, p72) are used**
- **ELISA positive and doubtful rezults are confirmed by indirect immunoperoxidase technique (IPT)**

The prevalence of ASFV in hunted and dead wild boars 2014-2016

Year	Active+passive surveillance			
	Number of wild boars tested	Number of positive wild boars	Percentage of positive wild boars	95% confidence interval (%)
2014	PCR / 22371	76	0.34 %	0.26-0.42
	ELISA / 7934	1	0.012 %	0.01-0.02
2015	PCR / 24122	124	0.51 %	0.42-0.60
	ELISA / 7219	23	0.32 %	0.19-0.45
	IPT / 5610	56	1.00 %	0.74-1.26
2016	PCR / 33685	458	1.36 %	1.24-1.48
	ELISA / 14660	57	0.39 %	0.29-0.49
	IPT / 2595	63	2.43 %	1.84-3.02

The results of detection ASFV in wild boar carcasses 2014-2016

Passive surveillance				
Year	**Number of wild boars tested**	**Number of positive wild boars**	**Percentage of positive wild boars**	**95% confidence interval (%)**
2014	223	54	24.2 %	18.58-29.82
2015	195	59	30.26 %	23.81-36.71
2016	785	379	48.28 %	44.60-51.65
Total	**1203**	**492**	**40.81%**	**38.03-43.59**

The prevalence of ASFV in hunted and dead wild boars 2017

Year	Active+passive surveillance			
	Tested	Positive	Prevalence	95% confidence interval (%)
2017	PCR / 13018	386	2.86 %	2.57-3.15
	ELISA / 5656	14	0.25 %	0.12-0.38
	IPA / 821	17	2.07 %	1.1-3.04

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The results of detection ASFV in wild boar carcasses 2017

Passive surveillance				
Year	Tested	Number of positive wild boars	Percentage of positive wild boars	95% confidence interval (%)
2017	482	353	73.24%	69.29-77.19

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Prevalence of ASF virus and specific antibodies in Lithuanian counties

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ASF virus yearly prevalence in wild boar carcasses

Year	Number of ASF positive wild boars	Percentage and 95% confidence interval (%)
2014	39	20.1 [14.46 - 25.74]
2015	43	23.12 [17.06 - 29.18]
2016	344	52.44 [48.62 - 56.26]
2017	393	71.32 [67.55 - 75.1]

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ASF virus seasonal prevalence in wild boar carcasses

Season	Number of ASF positive wild boars	Percentage and 95% confidence interval (%)
Winter	232	65.72 [60.77 - 70.67]
Spring	275	51.31 [47.07 - 55.53]
Summer	210	48.84 [44.11 - 53.56]
Autumn	102	38.06 [32.25 - 43.87]

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ASF virus yearly prevalence in hunted and dead wild boars (active and passive surveillance)

Year	Number of ASF positive wild boar (ELISA)	Percentage and 95% confidence interval (%)	Number of ASF positive wild boar (PCR)	Percentage and 95% confidence interval (%)
2014	2	0.03 [0 - 0.06]	122	0.83 [0.69 - 0.98]
2015	34	0.47 [0.31 - 0.63]	146	1.17 [0.98 - 1.35]
2016	62	0.42 [0.32 - 0.53]	402	2.27 [2.05 - 2.48]
2017	24	0.32 [0.19 - 0.45]	434	6.12 [5.56 - 6.68]

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ASF virus seasonal prevalence in hunted and dead wild boars (active and passive surveillance)

Season	Number of ASF positive wild boar (ELISA)	Percentage and 95% confidence interval (%)	Number of ASF positive wild boar (PCR)	Percentage and 95% confidence interval (%)
Winter	40	0.35 [0.24 - 0.46]	346	1.78 [1.6 - 1.97]
Spring	8	0.09 [0.03 - 0.15]	291	2.2 [1.95 - 2.45]
Summer	26	0.29 [0.18 - 0.4]	277	2.72 [2.41 - 3.04]
Autumn	48	0.66 [0.47 - 0.84]	190	1.91 [1.64 - 2.17]

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TOTAL POPULATION OF PIGS IN LITHUANIA (DATA OF 01/02/2017)

Size of the farm	Number of herds	Number of pigs
1-10	21806	71389
11-100	509	9888
101-500	25	6162
501-1000	8	5832
Over 1000	39	530590
Total	**22387**	**623861**

6 outbreaks in pig farms 2014: 1 in commercial farm and 5 backyard holdings

19 400 pigs at one of the country's largest farm were exterminated

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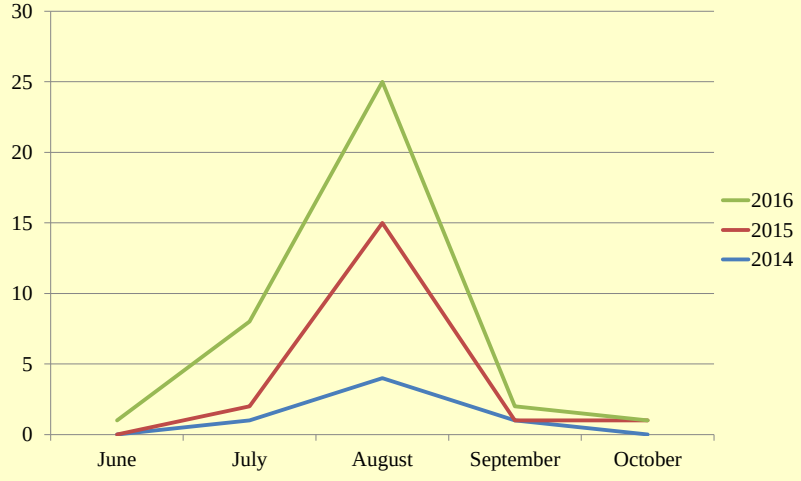
OUTBREAKS OF ASF IN DOMESTIC PIGS IN 2014-2016

2014: 6 outbreaks (1 in commercial farm, 5 in backyard holdings)
2015: 13 outbreaks (backyard holdings)
2016: 19 outbreaks (backyard holdings)

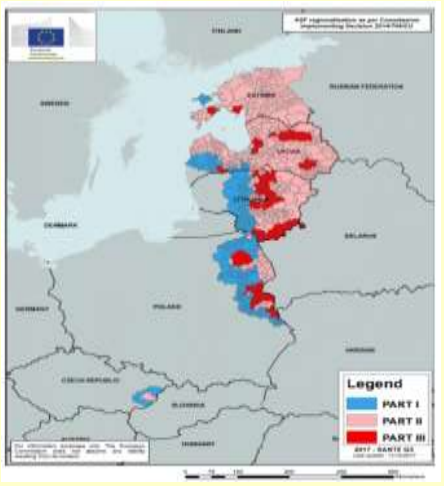
OUTBREAKS OF ASF IN DOMESTIC PIGS IN 2017:

25 outbreaks (in 23 backyard holdings and in 2 commercial farms)

SEASONAL DEPENDENCE OF ASF OUTBREAKS IN DOMESTIC PIGS



Recent zones of ASF in Lithuania
in accordance with the European Union legislation



DENSITY OF WILD BOAR (Number/km²) IN 2016
(DATA OF HUNTERS)

WILD BOAR DENSITY IN LITHUANIA
DO WE REALLY KNOW?

	2014	2015	2016
Number of WB counted in Lithuania	22325	27497	19699
Number of hunted WB during a season in Lithuania (data presented 15/04 each year)	50172	48317	42188

CONCLUDING REMARKS (1)

- ASF virus spread slowly in the Lithuanian wild boar population: prevalence of ASF virus in wild boars gradually increased every year since beginning of the study from 0.83% in 2014 to 6.12% in 2017
- The average of seasonal prevalence of ASF virus was significant ($p<0.05$) and ranged from 1.78% in winter to 2.72% in summer (ASF outbreaks in wild boars and pigs increase in summer months)
- Prevalence of ASF specific antibodies between seasons was not statistically significant
- The average ASF virus in the wild boar carcasses (passive surveillance) was 51.61% compared to hunted wild boars (active surveillance) where averange ASF virus and specific antibody prevalence was 0.57% and 0.33% respectively (finding and removal of wild boar carcasses is essential)

CONCLUDING REMARKS (2)

- **Yearly ASF virus prevalence of passive surveillance was consistent with total yearly prevalence and saw gradual increase from 20.1% in 2014 to 71.32% in 2017**
- **No correlation was detected between the wild boar density and number of recorded pig or wild boar ASF cases (standardised methods of wild boar density assessment are needed)**
- **A correlation between the pig density and number of recorded pig ASF cases in affected regions was found in 2017 (correlation coefficient $R=0.78$, $p<0.05$)**
- **Still not clear the way of ASF virus introduction, but biosecurity in pig holdings is crucial**
- **Human mediated spread of ASFV in Lithuania continues to play a critical role in the ASF epidemiology**

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THANK YOU FOR YOUR ATTENTION !