



## African swine fever virus introduction into the EU in 2014: Experience of Latvia



Edvīns Oļševskis<sup>a,e,\*</sup>, Vittorio Guberti<sup>b</sup>, Mārtiņš Seržants<sup>a</sup>, Jørgen Westergaard<sup>c</sup>, Carmina Gallardo<sup>d</sup>, Ieva Rodze<sup>e</sup>, Klaus Depner<sup>f</sup>

<sup>a</sup> Food and Veterinary Service, Rīga, Peldu 30, LV-1050, Latvia

<sup>b</sup> Istituto Superiore per la Protezione e la Ricerca Ambientale, Via Ca' Fornacetta, 9, 40064 Ozzano Emilia, Italy

<sup>c</sup> ADC-Consult, Mikkeltorg Alle 7, 2970 Hørsholm, Denmark

<sup>d</sup> EU Reference Laboratory for African swine fever, INIA-CISA, 28130 Valdeolmos, Madrid, Spain

<sup>e</sup> Institute of Food Safety, Animal Health and Environment - "BIOR", Rīga, Leļupes 3, LV-1076, Latvia

<sup>f</sup> Friedrich-Loeffler-Institut, Suedufer 10, 17493, Greifswald, — Insel Riems, Germany

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### ABSTRACT

African swine fever (ASF) virus was introduced in Latvia in June 2014. Thirty-two outbreaks in domestic pigs and 217 cases in wild boar were notified in 2014. Twenty-eight outbreaks (87.5%) were primary outbreaks. The contagiousity within pig herds was low. Failure to use simple biosecurity measures to reduce the chance of virus introduction, for example by inadvertent feeding of locally produced virus contaminated fodder were the main causes for the outbreaks in backyard holdings. The infection in wild boar survived locally in two different areas with a low prevalence and a slow spread. The persistence of the infection in wild boar within an area was most probably linked to wild boar scavenging the carcasses of infected wild boar.

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The African swine fever virus (ASFV) currently affecting Eastern European countries and Baltic States has been classified as genotype II and is highly virulent, leading to high rates of lethality in infected animals and associated with peracute and acute haemorrhagic disease (Blome et al., 2012; Gallardo et al., 2015). The epidemic started in Georgia in 2007 and spread throughout the Caucasus and the Russian Federation where the disease has become endemic (Gogin et al., 2013; Sánchez-Vizcaíno et al., 2013). In July 2012, ASF was detected in Ukraine and in June 2013 it was notified by Belarus (EFSA, 2014). In January 2014 ASFV was confirmed in wild boar in Lithuania and in February 2014 in Poland.

ASF was detected in Latvia in June 2014, with a total of 32 outbreaks in domestic pigs and 217 wild boar cases reported by year end. For disease confirmation blood and tissue samples were tested for the presence of virus genome and antibodies at the Latvian National Reference Laboratory for ASF. For ASFV detection real-time PCR was used according to the ASF diagnostic manual of the EU (Anonymous, 2003). For antibody detection a commercially available ASF antibody ELISA (INGEZIM PPA COMPAC ELISA, Ingenasa) was used according to the

manufacturer's instructions. ELISA positive and doubtful results were confirmed by Immunoperoxidase technique.

Twenty outbreaks occurred in backyard holdings with up to ten pigs; ten holdings had between 11 and 50 pigs; one holding had 56 pigs and one holding had 196 pigs. Most of the outbreaks ( $n = 30$ ) occurred during July and August 2014. Twenty-five outbreaks were located in the south-eastern part and seven outbreaks in the north of Latvia. All outbreaks were detected in areas where ASF was present in wild boar.

On the 32 infected pig holdings a total of 585 animals were present of which 147 were sampled. Sixty-nine animals were found to be PCR positive. A total of seven pigs were both sero-positive and PCR positive; these pigs were located at three different holdings.

Thirty-one of the infected farms have been identified by passive surveillance. One farm has been detected by active surveillance. It can be concluded that passive surveillance worked properly confirming the success of awareness campaigns carried out by the Food and Veterinary Service.

Twelve farms were notified as suspected before any animal died whereas on 20 farms veterinarians were called after the death of at least 1 pig. On several holdings only one or a few diseased or dead animals were present at the time of suspicion. Other animals, living in the same stable, were clinically healthy. It appears that, at least at the

\* Corresponding author at: Food and Veterinary Service, Rīga, Peldu 30, LV-1050, Latvia.  
E-mail address: [edvins.olsevskis@pvd.gov.lv](mailto:edvins.olsevskis@pvd.gov.lv) (E. Oļševskis).

**Table 1**

Laboratory results for ASF of hunted and found dead wild boar (WB) in the infected regions of Latvia in 2014<sup>a</sup>.

Regions	Area size (infected counties)	Estimated WB density (animals/km <sup>2</sup> )	Hunted	WB found	Cases
	km <sup>2</sup>		WB (PCR+)	dead (PCR+)	
			Prevalence	Prevalence	
Latgale-North	4166	2000 (0,5)	973 (2) 0,2%	10 (7) 70%	9
Latgale-South	2974	1800 (0,6)	838 (24) 2,9%	89 (60) 67,4%	84
Madona	2962	2000 (0,7)	290 (0)	24 (13) 54%	13
Vidzeme	2807	2000 (0,7)	666 (15) 2,3%	122 (95) 88%	110
Total	12,909	7800 (0,6)	2765 (41) 1,5%	245 (175) 71,4%	216

<sup>a</sup> One ASF case from the Alūksne region which is linked epidemiologically and geographically with cases in south Estonia is not included in this table.

onset, ASFV had a very low transmission rate and a clear evidence of pig-to-pig transmission during the early stage of infection was lacking. These field observations indicate that virus transmission from one animal to the next is rather a delayed process confirming a moderate ASF contagiousity. Similar observations have been made under experimental conditions with the same genotype II virus (Pietschmann et al., 2015).

Twenty-eight outbreaks (87.5%) were classified as primary outbreaks and four outbreaks (12.5%) were seen as secondary outbreaks; 16 primary outbreaks were most probably caused by swill feeding

while 12 outbreaks could be linked to the ongoing infection in the wild boar population. The secondary outbreaks were caused by people having contacts with infected farms.

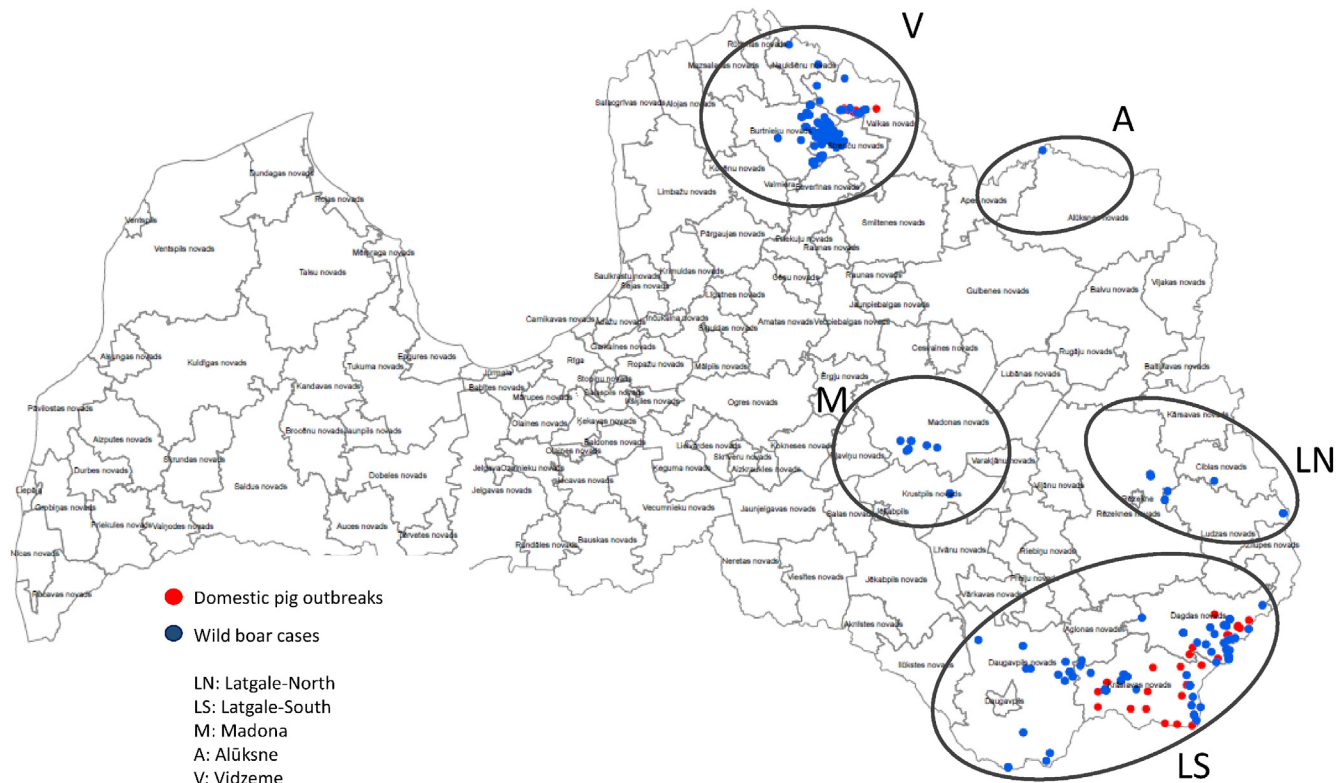
All outbreaks were detected within four weeks from the time of virus introduction in the farm. Indicators like a number of sick or dead animals and the presence of PCR positive and/or seropositive animals at the time of suspicion were used to estimate more exactly the potential date of virus introduction. In the absence of any seropositive but only PCR positive animals ( $n = 29$ ), infection was not older than two weeks. On three farms where PCR positive and seropositive animals were found, infection must have lasted for about 2–4 weeks. Farms with convalescent animals which would have tested seropositive only, indicating an older introduction, were not found.

Biosecurity shortcomings and feeding of potentially contaminated fresh grass or crops were the most serious factors responsible for virus introduction into the holdings. However swill feeding as a source could not be excluded. Basic biosecurity measures, change of footwear, outer clothing and disinfecting as required by national legislation were not followed.

Regarding the disease in wild boar 175 (71.4%) of the positive cases belonged to the group of animals ( $n = 245$ ) which were found dead in the forests and fields (Table 1). From the 2765 hunted wild boar 41 (1.7%) tested PCR positive. In total 24 (0.9%) out of 2475 tested animals had ASF antibodies; 14 of the seropositive wild boar were also PCR positive while 13 animals had antibodies only.

The first positive wild boar ( $n = 7$ ) were found in the Dagdas County (Latgale-South Region), located on the border with Belarus (Fig. 1). It was assumed that the virus entered Latvia via infected wild boar at the beginning of June 2014.

A further 77 wild boar cases were detected by December 2014 in Latgale-South Region. In Latgale-North positive animals ( $n = 9$ ) were detected only from August until October. A direct link between the two different clusters (Latgale-South and Latgale-North) could not be demonstrated.



**Fig. 1.** Location of ASF outbreaks and cases in Latvia in 2014.

The second region affected by ASF was Vidzeme in the north of Latvia (July, 2014), a region that shares a border with Estonia. Illegal disposal of offal into the forest from slaughtered pigs and wild boar with unknown status might have initiated the infection. In September 2014 the first positive cases were reported from Estonia on the other side of the border. It was concluded that infection spread from Vidzeme region in Latvia to south of Estonia.

The third region affected by ASF was Madona. The virus introduction must have occurred mid/end July when an increased virus activity was observed in the Latgale region. However, it remained unclear how ASFV reached Madona.

In Latgale-South and Vidzeme the infection kept ongoing locally with a steady low prevalence (below 3%) and without any rapid spatial spread.

The persistence of the infection in wild boar population within an area was most probably linked to the long term survival of the virus in the environment including carcasses which may remain in the fields for weeks.

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