ASF in Wild Boar

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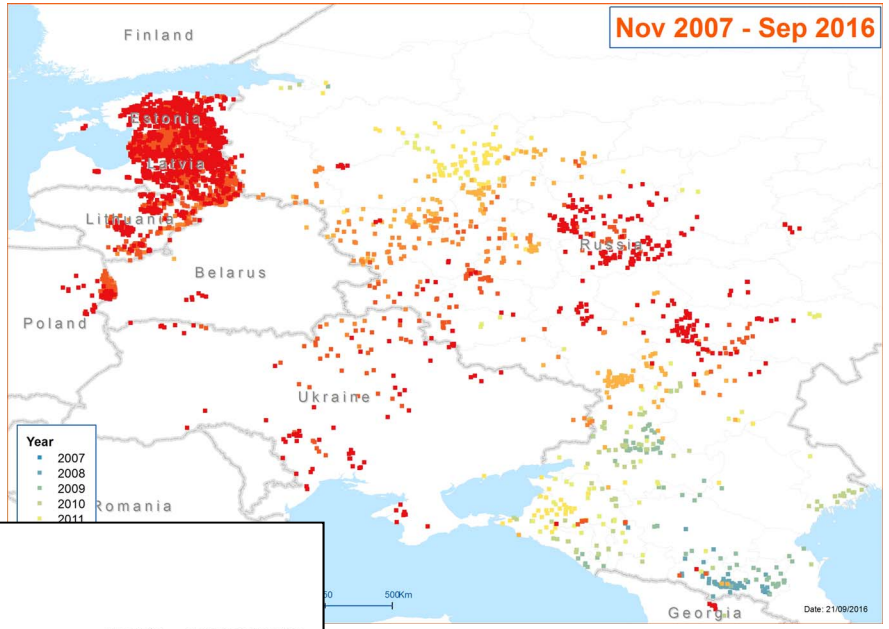
Animal and Plant Health

FACE meeting, 6 April 2017, Brussels

EFSA work on ASF



SCIENTIFIC OPINION

Scientific Opinion on African Swine Fever[1]

EFSA Panel on Animal Health and Welfare (AHAW)[2, 3]

European Food Safety Authority (EFSA), Parma, Italy

efsa European Food Safety Authority — EFSA Journal 2014;12(4):3628

SCIENTIFIC OPINION

Scientific Opinion on African swine fever[1]

EFSA Panel on Animal Health and Welfare (AHAW)[2, 3]

efsa European Food Safety Authority — EFSA Journal 2014;12(3):3616

SCIENTIFIC REPORT OF EFSA

Evaluation of possible mitigation measures to prevent introduction and spread of African swine fever virus through wild boar[1]

European Food Safety Authority[2, 3]

Scientific Report

EFSA Journal

SCIENTIFIC OPINION

ADOPTED: 23 June 2015 — PUBLISHED: 14 July 2015

doi:10.2903/j.efsa.2015.4163

African swine fever

EFSA Panel on Animal Health and Welfare (AHAW)

2010 2011 2012 2013 2014 2015 2016

THE VIRUS (EFSA, 2010)

Source: www.nature.com

- ASFV genotype II strain
- highly virulent
- causes acute ASF with high lethality in domestic pigs and wild boar
- no scientific evidence that the virus has reduced its virulence since the first outbreak in 2007 in Georgia
- very resistant to inactivation in the environment
- may persist for several months in frozen or uncooked meat
- no infectious ASF virus has been found in cooked or canned hams when heated at 70° C for 30 min

EVALUATION OF ASF INTRODUCTION PATHWAYS (EFSA, 2014)

Rank	Matrix
Very high	Frozen meat
High	Chilled meat, Skin fat, Wild boar (transported), Domestic pigs (transported), Vehicles for animal transport-contaminated inside
Moderate	Naturally smoked meat, Salted, fermented, dried (+/- spiced) meat (e.g. pepperoni, salami,…), Salted, dried meat (e.g., salted and dried hams, shoulders, loins…), Any vehicles-contaminated outside, People involved with pig-keeping, Slurry, Animal feed, Litter, Fomites
Low	People not involved with pig-keeping, Ticks
Very low	Vegetables, Crops, Pests (rodents), Pets, Hay and straw, Bloodsucking insects
Negligible	Meat cooked for 70 °C for 30 min

ASF AND TICKS (EFSA, 2010)

Source: http://www.afrivip.org

- *Ornithodorus spp*. ticks are the only species known to transmit ASFV
- Important in maintaining local foci of ASF, but do not play a role in geographical spread of ASFV
- Epidemiological role played by ticks may become important where pigs are managed under traditional systems, including old shelters/sties with crevices
- Wild boar have never been found infested because they normally do not rest inside protected burrows, which may be infested by ticks

WILD BOAR POPULATION CONTROL (EFSA, 2014)

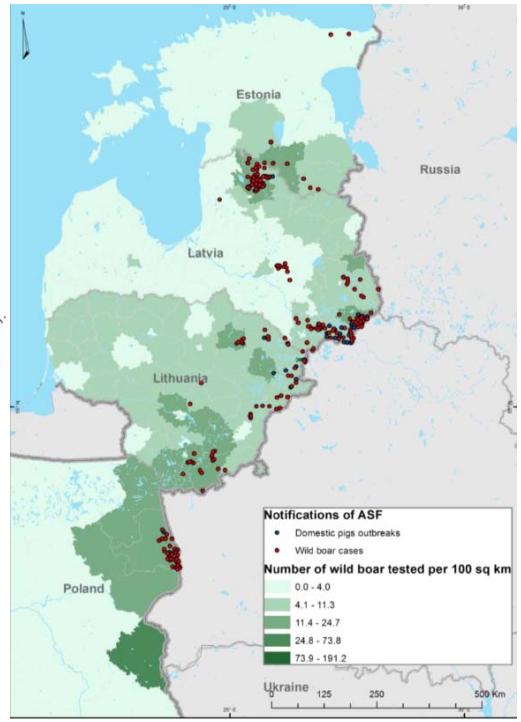
Source: www.italiansafari.com/

- hunting and trapping has never achieved a drastic reduction in a wild boar population in Europe
- intensive hunting pressure on wild boar populations leads to dispersal of groups and individuals
- depopulation efforts can lead to adaptive behaviour of the hunted wild boar, compensatory growth of the population and the influx of wild boar from adjacent areas
- artificial feeding of wild boar might rather increase than reduce the risk of ASFV spread
- increased hunting rates, especially for females, can reduce wild boar populations, as all age classes of females are highly reproductive

ASFV DETECTIONS IN WILD BOAR (EFSA, 2015)

Country	Hunted wild boar		Found dead wild boar	
	Number tested by PCR	Number positive	Number tested by PCR	Number positive
Latvia	7 443	49	393	229
Poland	15 514	9	2 088	56
Lithuania	13 870	94	1 345	53
Estonia	1 194	63	239	94
Total	3 8021	215	4 065	432

Source: data extracted from the national laboratories from 1 February 2014 until 28 February 2015.



Source: ADNS (24/01/2014-10/03/2015)

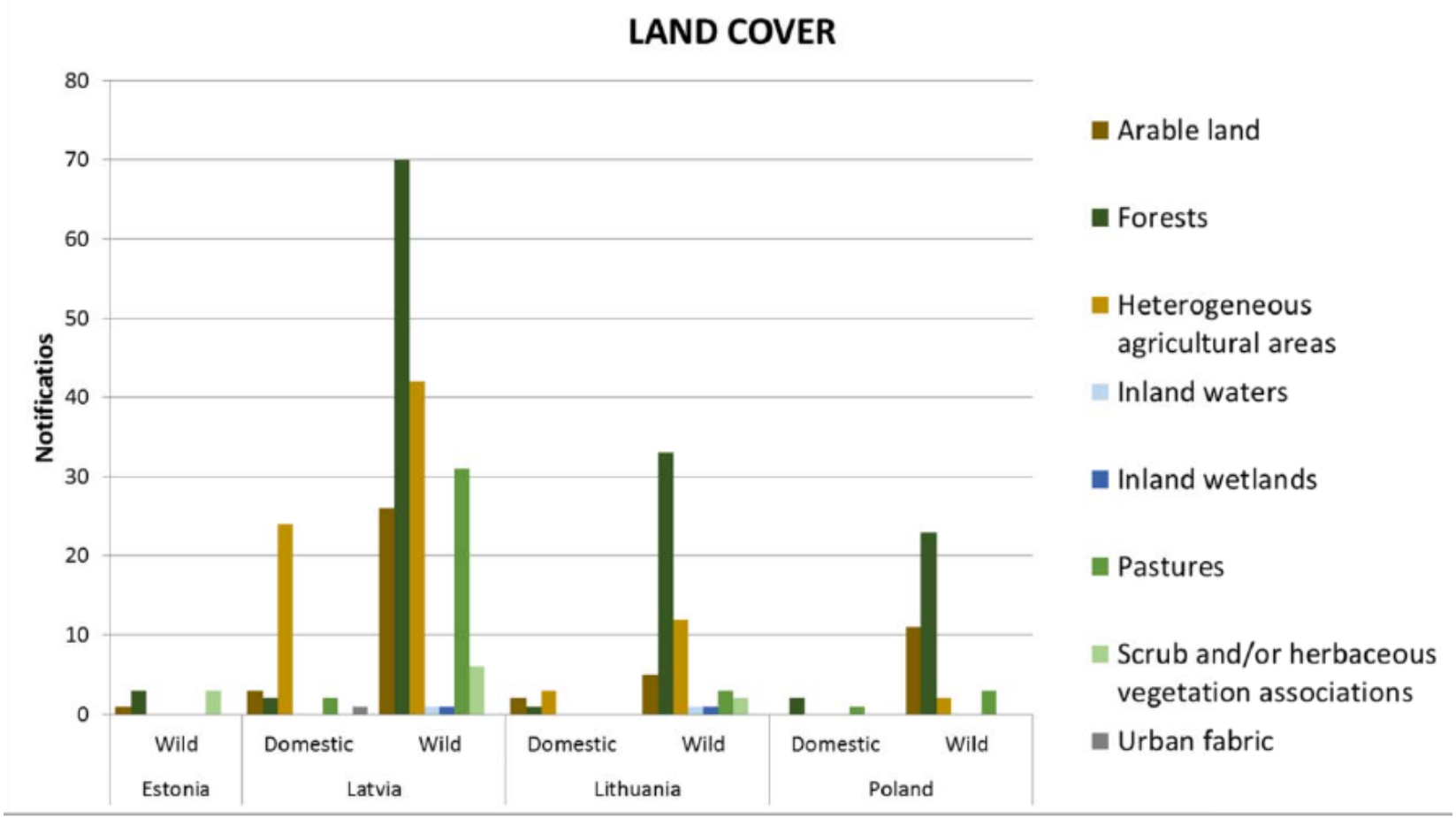
Number of wild boar tested per 100 km² in each NUTS 3 level regions

Estimated average <u>carcass detection</u> rate:

- 8.9 % (n = 13, range 2.7–19.3 %)
- no significant correlation with prevalence, reported population density
- determined by factors such as season or habitat type

ASF OUTBREAKS BY HABITAT (EFSA, 2015)

Notifications by land cover (CORINE land cover map)



SEASONAL ASF PREVALENCE VARIATION (EFSA, 2015)

PCR+ hunted wild boar, Poland, Latvia, 02/14-02/15

Season	ASF virus prevalence (%)					Chi-squared test with Yates' correction, P-values		
	"–"	"+"	Total	Mean	95 % CI	Spring	Summer	Autumn
Winter	4469	15	4484	0,3	0.19–0.55	0.3093	0.0001	0.1979
Spring	599	0	599	0,0	0.0–0.61		0.0171	0.1333
Summer	2162	25	2187	1,1	0.74–1.68			0.0248
Autumn	3228	18	3246	0,6	0.32–0.87			

PREVALENCE VARIATION GENDER & AGE (EFSA, 2015)

	Mean Prevalence (%)	95% Confidence Interval (%)	Fisher's exact test
Hunted animals			
Males	0.65	0.42–0.97	P = 0.1639
Females	0.38	0.18–0.69	
Animals found dead			
Males	32.7	20.3–47.1	P = 0.0635
Females	50.7	38.4–63.0	

	Mean Prevalence (%)	95% Confidence Interval (%)	Fisher's exact test
Hunted animals			
Adults	0.32	0.2-0.6	
Sub-adults	0.94	0.6–1.4	P > 0.02
Piglets	14.3	3.1–36.3	
Animals found dead			
Adults	47.7	38.1–57.5	
Sub-adults	70.5	61.9–78.2	P < 0.002
Piglets	66.7	44.7– 84.4	

SPREAD & PERSISTENCE (EFSA, 2015)

- current epidemiological picture of ASF in the EU suggests that ASF spreads locally in the wild boar population, independent of outbreaks in domestic pigs
- currently no evidence that the virus persists in backyard farms
- as yet, no scientific data demonstrates ASFV shedding by carriers
- continued circulation of ASFV is possible as result of, e.g., illegal movement of infected pig meat, low biosecurity in pig holdings, aggregation of wild boar around feeding

EFSA COLLABORATION WITH ASF-AFFECTED COUNTRIES

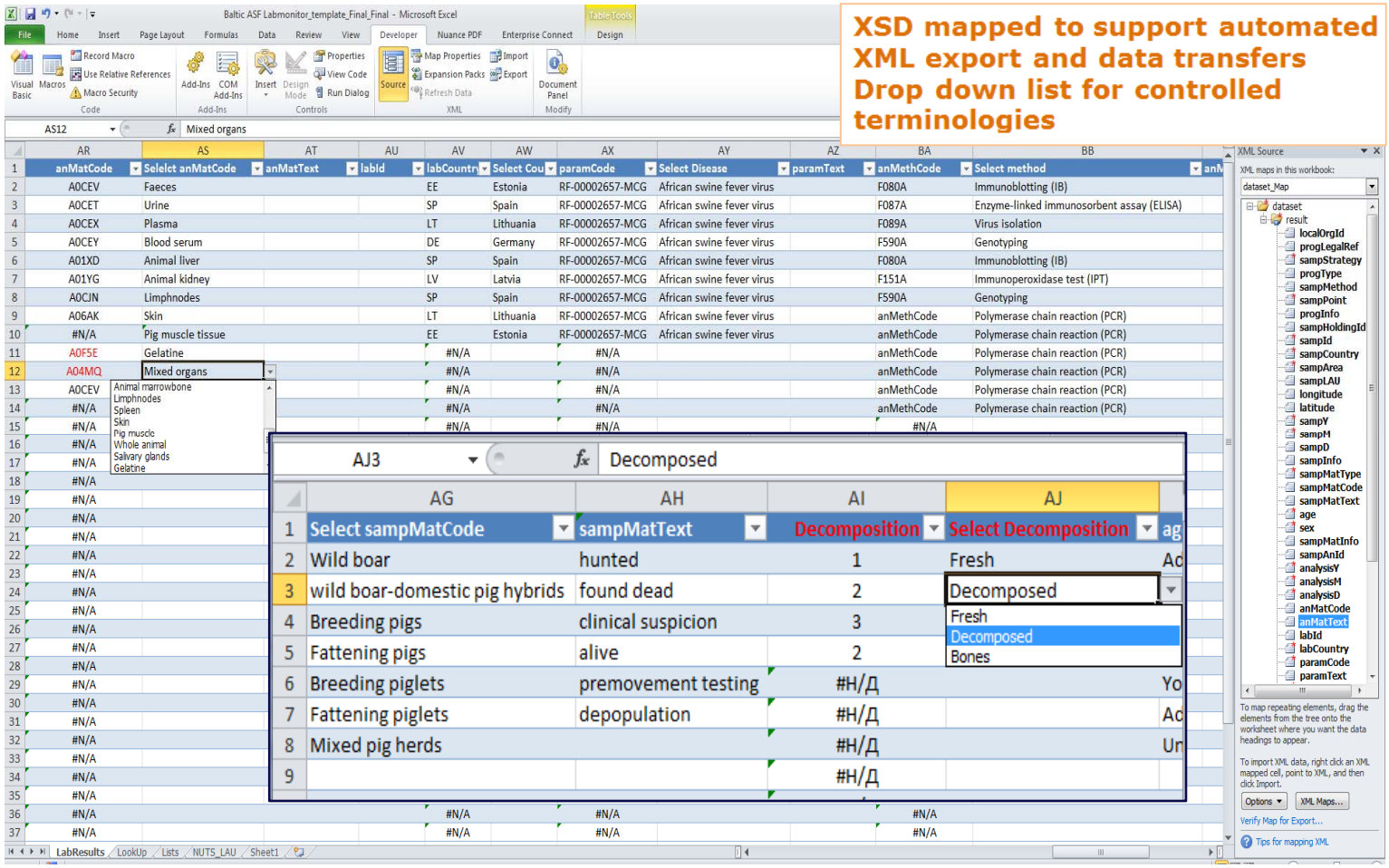
Workshops - Data collection - Analysis - Reporting

Harmonisation of data collection
Parma, Italy, 23-25 November 2015

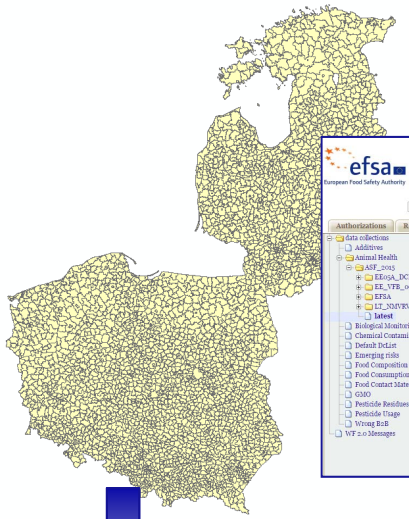
Descriptive epidemiological analysis
Riga, Latvia, 29-30 June 2016

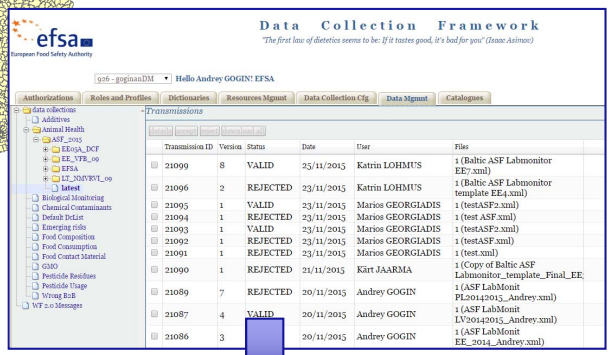
Epidemiological modelling
2017

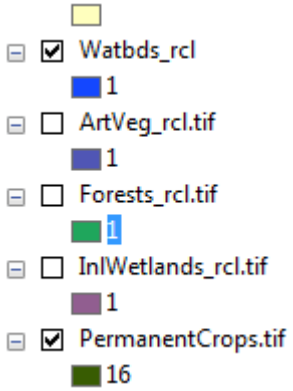
EXCEL-BASED TEMPLATE FOR DATA COLLECTION

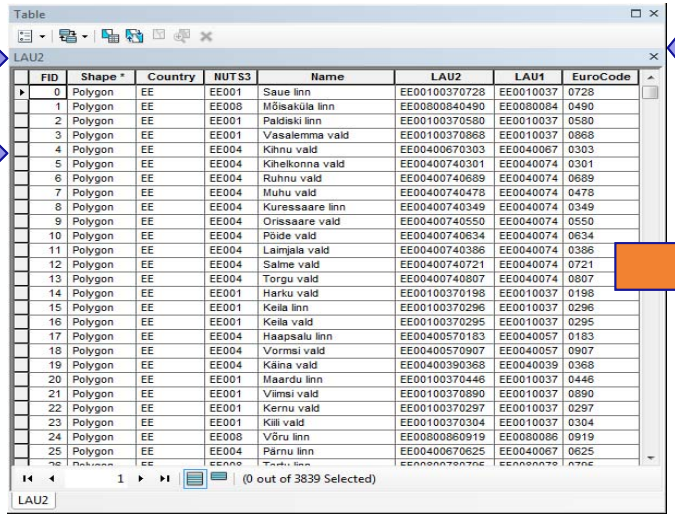


COMBINATION OF DATA









FID	Shape *	Country	NUTS3	Name	LAU2	LAU1	EuroCode
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2	Polygon	EE	EE001	Paldiski linn	EE00100370580	EE0010037	0580
3	Polygon	EE	EE001	Vasalemma vald	EE00100370868	EE0010037	0868
4	Polygon	EE	EE004	Kihnu vald	EE00400670303	EE0040067	0303
5	Polygon	EE	EE004	Kihelkonna vald	EE00400740301	EE0040074	0301
6	Polygon	EE	EE004	Ruhnu vald	EE00400740689	EE0040074	0689
7	Polygon	EE	EE004	Muhu vald	EE00400740478	EE0040074	0478
8	Polygon	EE	EE004	Kuressaare linn	EE00400740349	EE0040074	0349
9	Polygon	EE	EE004	Orissaare vald	EE00400740550	EE0040074	0550
10	Polygon	EE	EE004	Pöide vald	EE00400740634	EE0040074	0634
11	Polygon	EE	EE004	Laimjala vald	EE00400740386	EE0040074	0386
12	Polygon	EE	EE004	Salme vald	EE00400740721	EE0040074	0721
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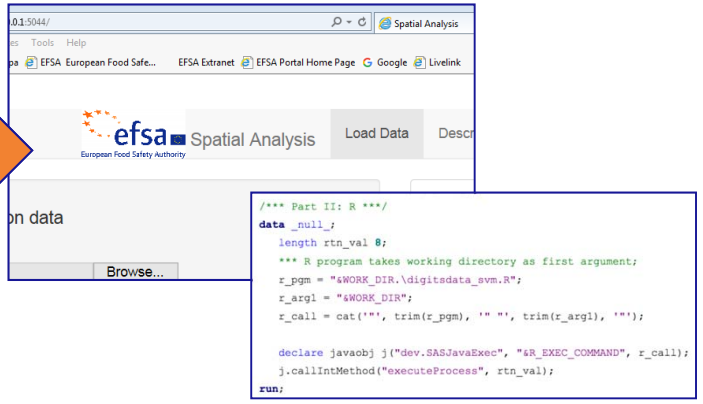


"NATIONAL REPORT" (SAS SOFTWARE)

11:55 Friday, June 3, 2016

African Swine Fever

Reporting country	Reporting Year
Estonia	2014
	2015

Summary of samples by species, tissue type, status of sample and analytical method

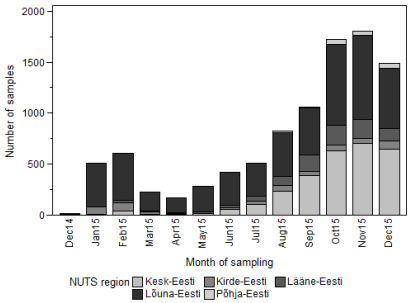
Species	Status of animal	Tissue type	Laboratory analysis	Number of samples	Maximum number of tests per sample	Positive samples	Negative samples
Wild boar	depopulation	Animal offal and other slaughtering products,	PCR,	2	1	0	2
		Blood serum,Blood serum	Enzyme-linked immunosorbent assay (ELISA),PCR	14	2	0	14
			Immunoblotting (IB),PCR	1	2	1	0
	found dead	Animal offal and other slaughtering products,	PCR,	94	1	66	28
		Blood serum,	Enzyme-linked immunosorbent assay (ELISA),	12	1	1	11
			PCR,	2	1	2	0
		Blood serum,Blood serum	Enzyme-linked immunosorbent assay (ELISA),Immunoblotting (IB)	18	3	1	17
			Enzyme-linked immunosorbent assay (ELISA),PCR	92	2	2	90
			Immunoblotting (IB),PCR	1	2	1	0
		Pig marrowbone,	PCR,	721	1	558	163
		Pig marrowbone,Pig marrowbone	Immunoperoxidase test (IPT),Molecular characterisation/Genotyping method	1	5	0	1
	hunted	Animal offal and other slaughtering products,	PCR,	54	1	4	50
		Blood serum,	Enzyme-linked immunosorbent assay (ELISA),	58	1	2	56
			Immunoblotting (IB),	1	1	1	0

Page 1

11:55 Friday, June 3, 2016

11:55 Friday, June 3, 2016

African Swine Fever



Checking assigment of SampID for samples with more than two tests

SAMPID=EE1500088001

N_tested	SAMPID	RESID	SAMPDATE	NUTS region	HOST	TISSUE	SAMPMATTEXT	ANMETHCODETEXT	RESQUALVALUE
3	EE1500088001	EE2982970	05/01/15	Kirde-Eesti	Wild boar	Blood serum	found dead	Enzyme-linked immunosorbent assay (ELISA)	POS
3	EE1500088001	EE2982971	05/01/15	Kirde-Eesti	Wild boar	Blood serum	found dead	PCR	NEG
3	EE1500088001	EE3151104	05/01/15	Kirde-Eesti	Wild boar	Blood serum	found dead	Immunoblotting (IB)	POS

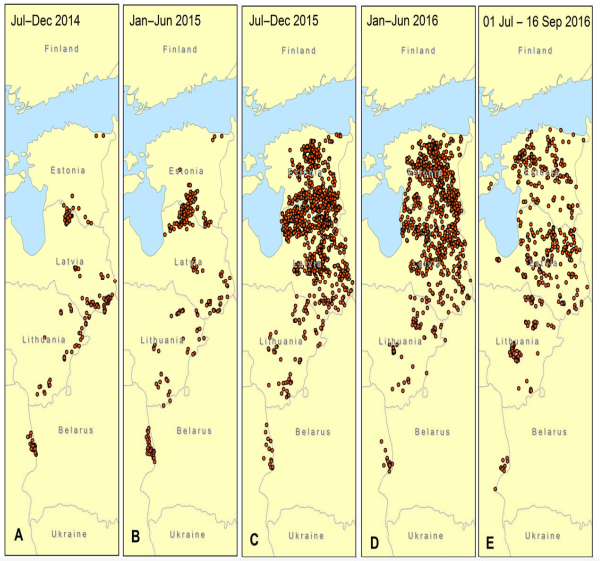
SAMPID=EE1500104001

N_tested	SAMPID	RESID	SAMPDATE	NUTS region	HOST	TISSUE	SAMPMATTEXT	ANMETHCODETEXT	RESQUALVALUE
3	EE1500104001	EE2983010	05/01/15	Kirde-Eesti	Wild boar	Blood serum	hunted	Enzyme-linked immunosorbent assay (ELISA)	POS
3	EE1500104001	EE2983011	05/01/15	Kirde-Eesti	Wild boar	Blood serum	hunted	PCR	NEG
3	EE1500104001	EE3151103	05/01/15	Kirde-Eesti	Wild boar	Blood serum	hunted	Immunoblotting (IB)	POS

1ST SCIENTIFIC REPORT

Conclusions:

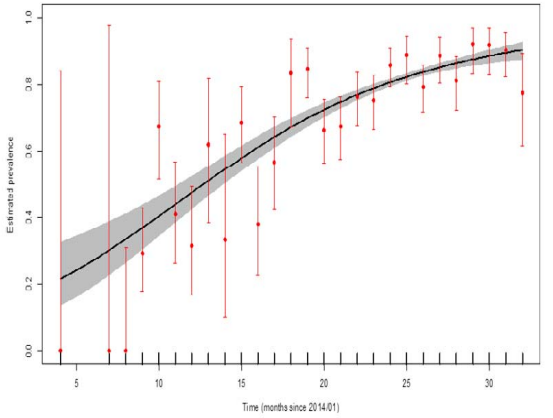
- Currently the ASF cases in wild boar in Estonia, Latvia, Lithuania and Poland show the spatio-temporal pattern of a **small-scale epidemic**;
- The **average spatial spread of the disease in wild boar** subpopulations in **Latvia and Estonia** is approximately **2 km/month**, while in **Lithuania and Poland** the average spatial spread of the disease is approximately **1 km/month**, which indicates a **slow spread** in the region;
- **Virus prevalence in hunted wild boar** is very low (0.04 and 3%), **without any apparent increasing trend** over time;
- **No clear time trend in ASFV-antibody prevalence** has been observed in hunted wild boar;
- Since the beginning of the epidemic, the apparent antibody prevalence in hunted wild boar has always been lower than the apparent virus prevalence in hunted wild boar, indicating an **unchanged epidemiological/immunological situation**.

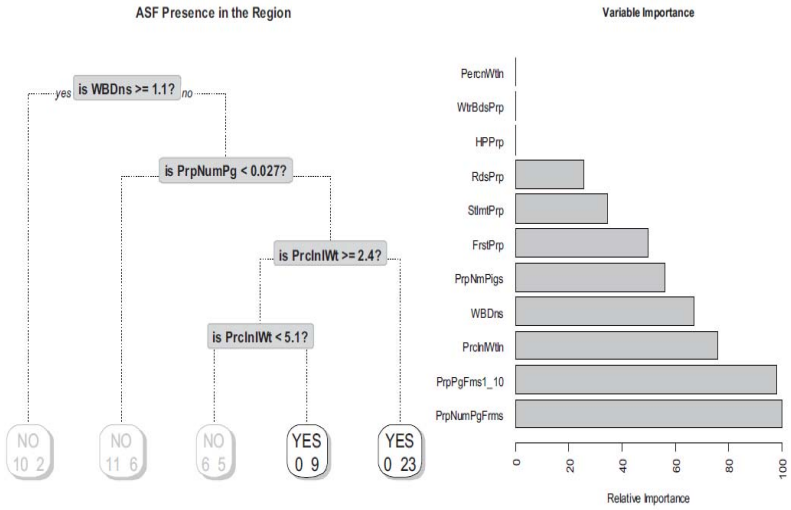


1ST SCIENTIFIC REPORT

Conclusions:

- The risk factor analysis shows an **association between the number of settlements and pig farms, forest coverage, number of roads and the notification of ASF** in wild boar in 2016;
- According to the risk factor analysis the number of **human settlements is associated with ASF notification** in wild boar in Estonia, Latvia and Lithuania in 2015 and 2016;
- Given existing trends in apparent virus prevalence and seroprevalence, there is a **need to maintain high biosecurity standards on pig farms and adjust control measures in the backyard sector and at hunting grounds level.**





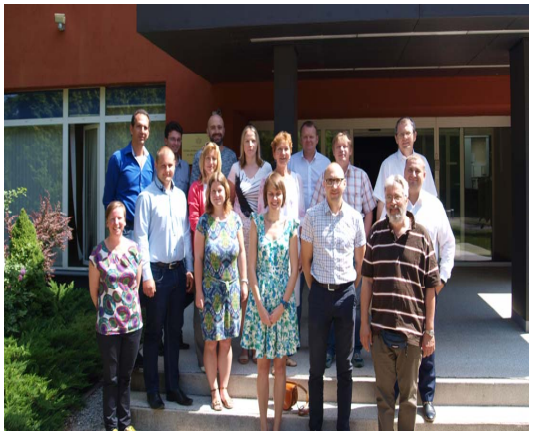
2ND SCIENTIFIC REPORT (OCTOBER 2017)

Objectives

- Update descriptive epidemiological analysis
- Update risk factors analysis involved in the occurrence, spread and persistence of the ASF virus in the wild boar population and in the domestic/wildlife interface
- Review the management options for wild boar identified in the EFSA scientific opinion of June 2015

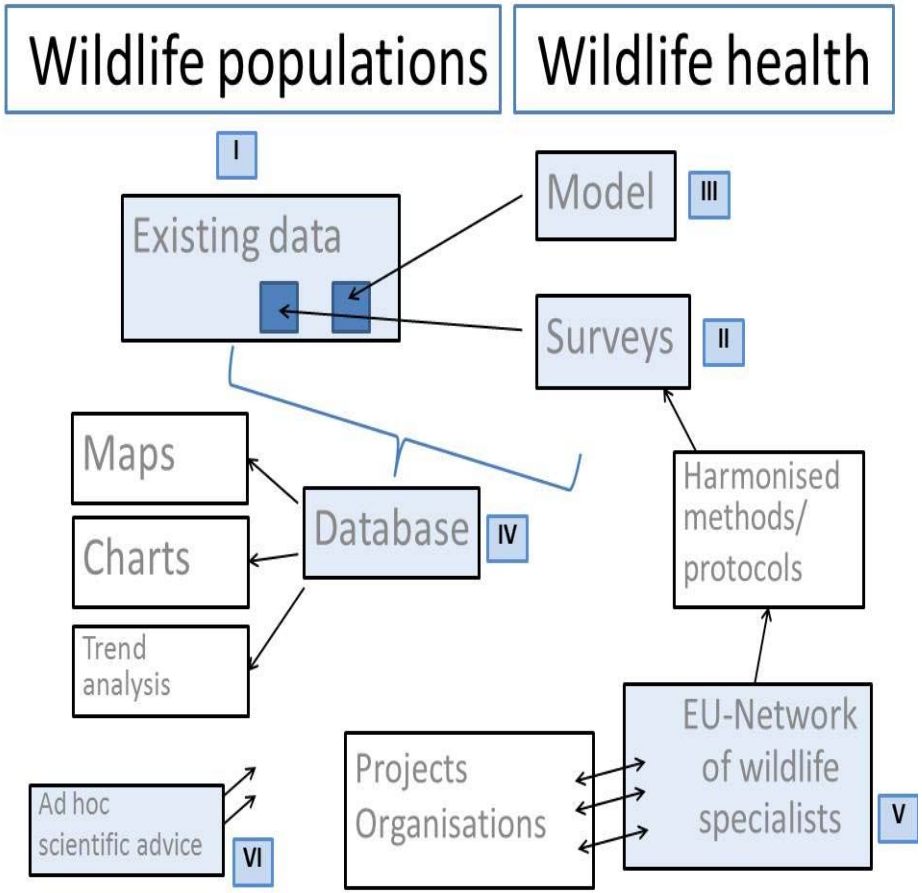
EFSA'S ACTIVITY ON ASF

2015	2016	2016	2017
WORKSHOP: Harmonization of data collection in the Baltic countries and Poland Parma, Italy 23 November 2015	**REQUEST**: Scientific and technical assistance on ASF - Harmonization of data collection - Update epidemiological analysis - 2 Scientific Reports (Oct 2016 and Oct 2017)	**WORKSHOP:** "Epidemiological and risk factors analysis of African swine fever" Riga, Latvia 29-30 June 2016	**WORKSHOP:** "Epidemiological modelling" Parma, June 2017



- http://www.efsa.europa.eu/en/events/event/151123

MULTIANNUAL PROJECT ON WILDLIFE SURVEILLANCE



THE « ASF TEAM» - ACKNOWLEDGEMENTS

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