

# How to survive in an ASF endemic country? A pig producer's view on biosecurity measures

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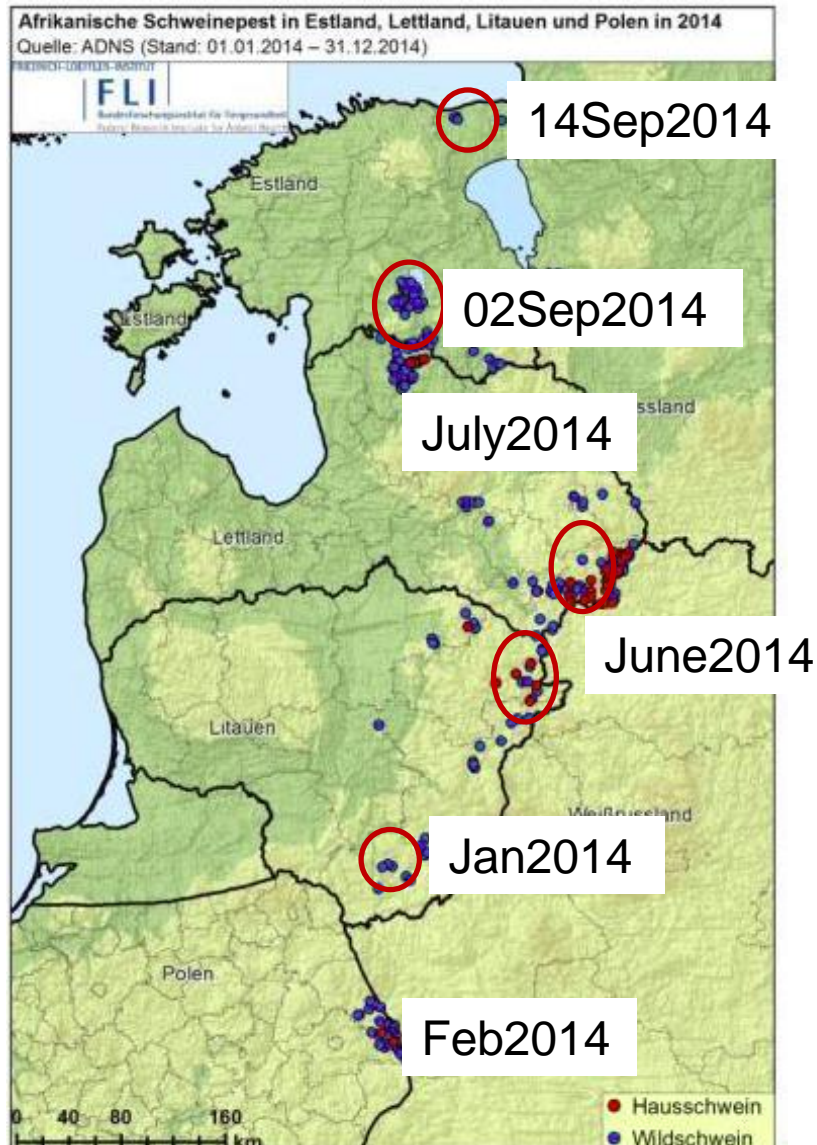


# **ASF in domestic pigs in Estonia**

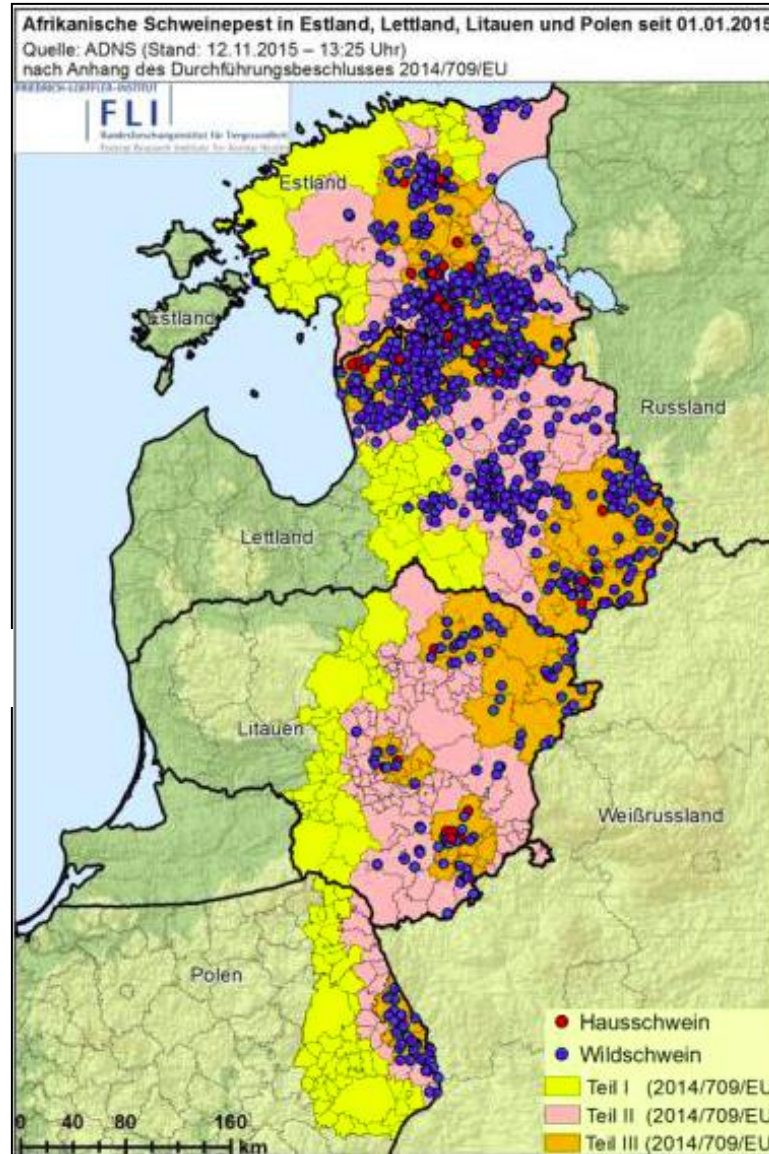


# ASF expansion in Baltic states and Poland 2014-2016

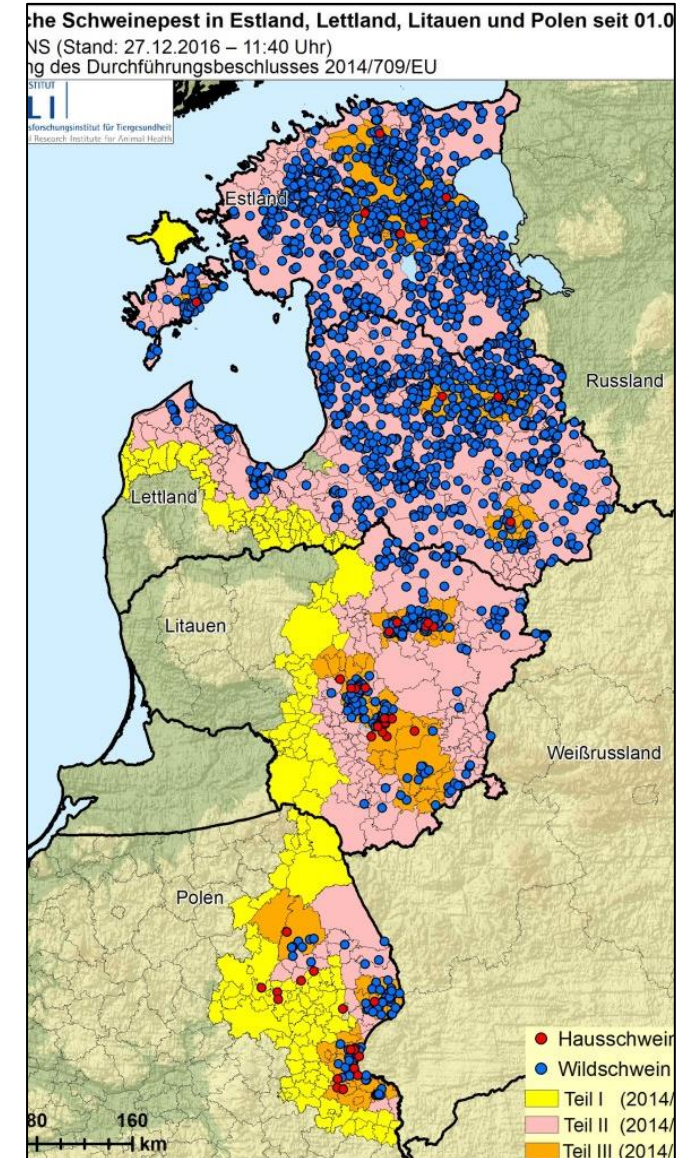
2014



2015



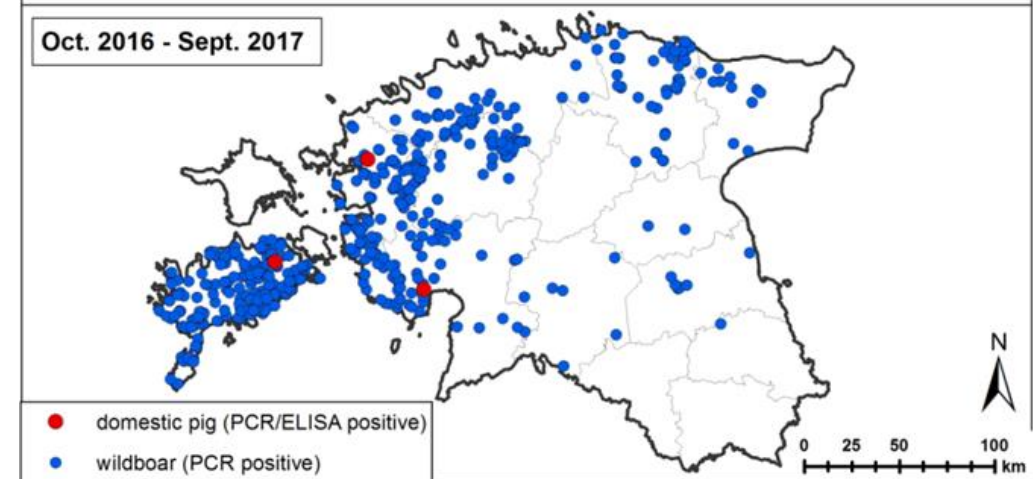
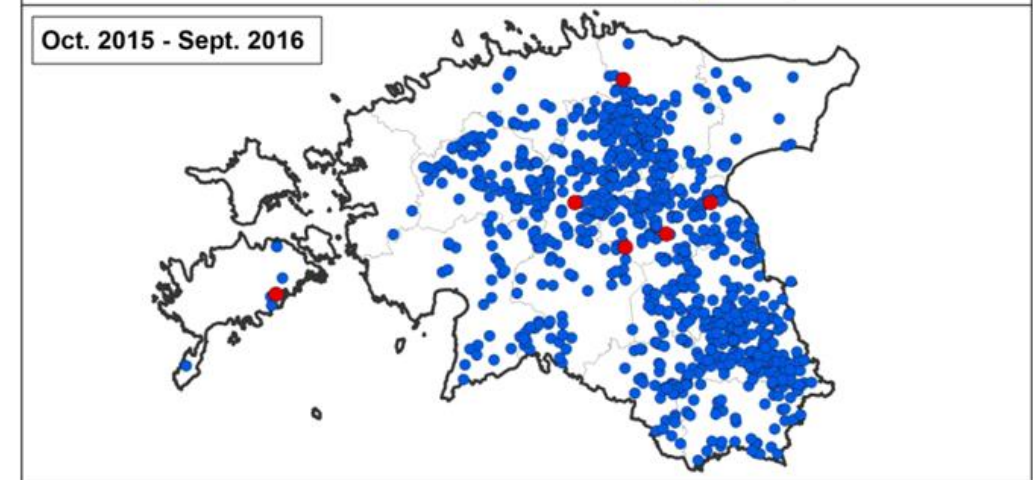
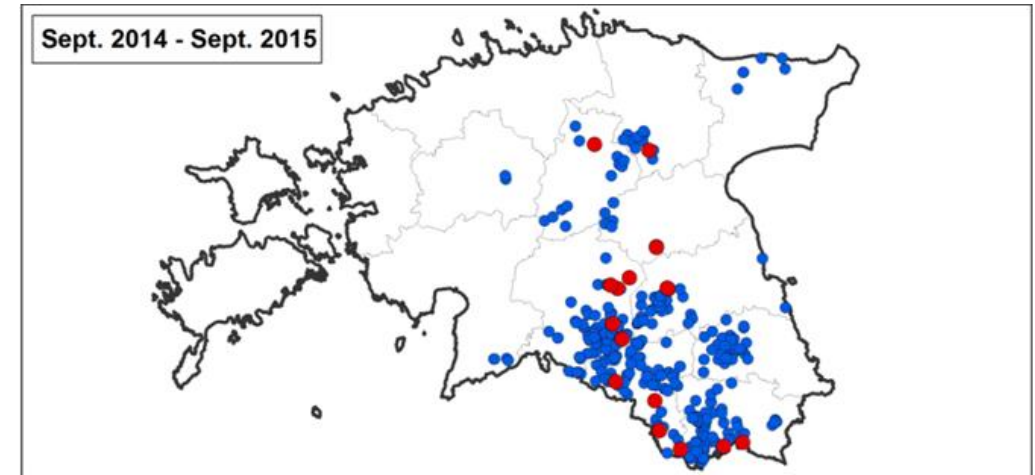
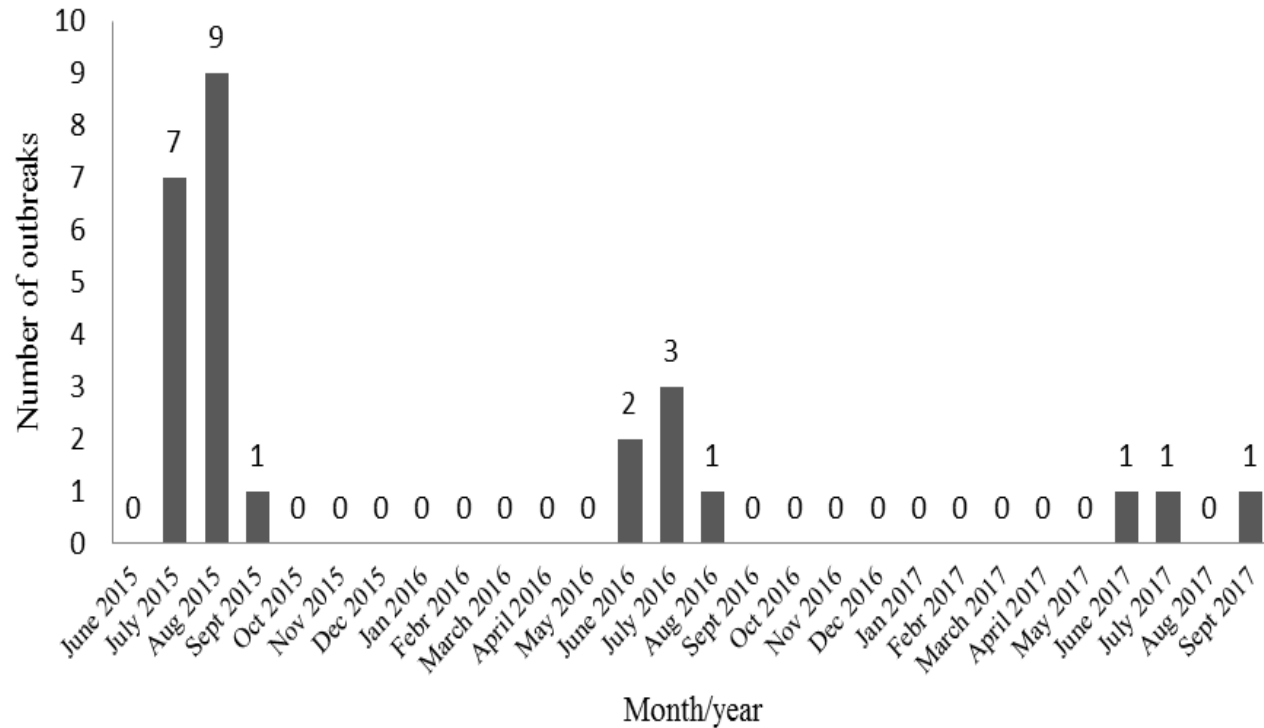
2016





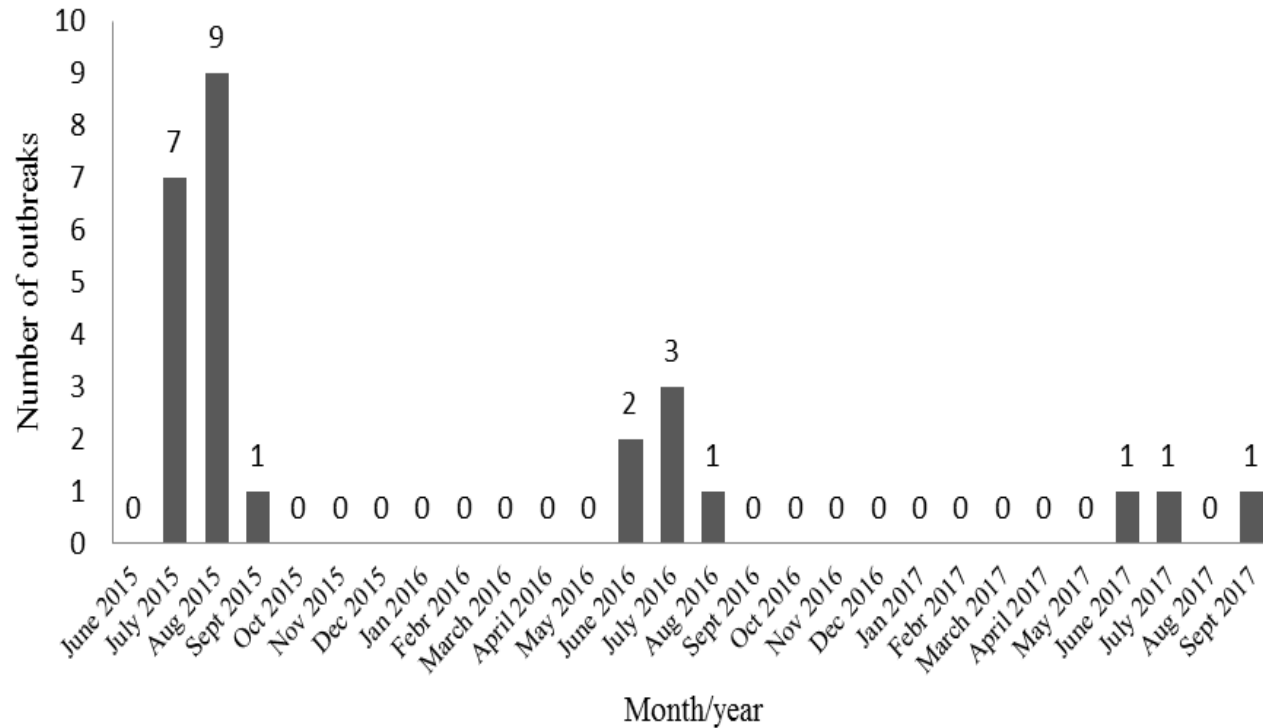
# Domestic pig outbreaks

2014	2015	2016	2017	2021	2023
0	18	6	3	1	2

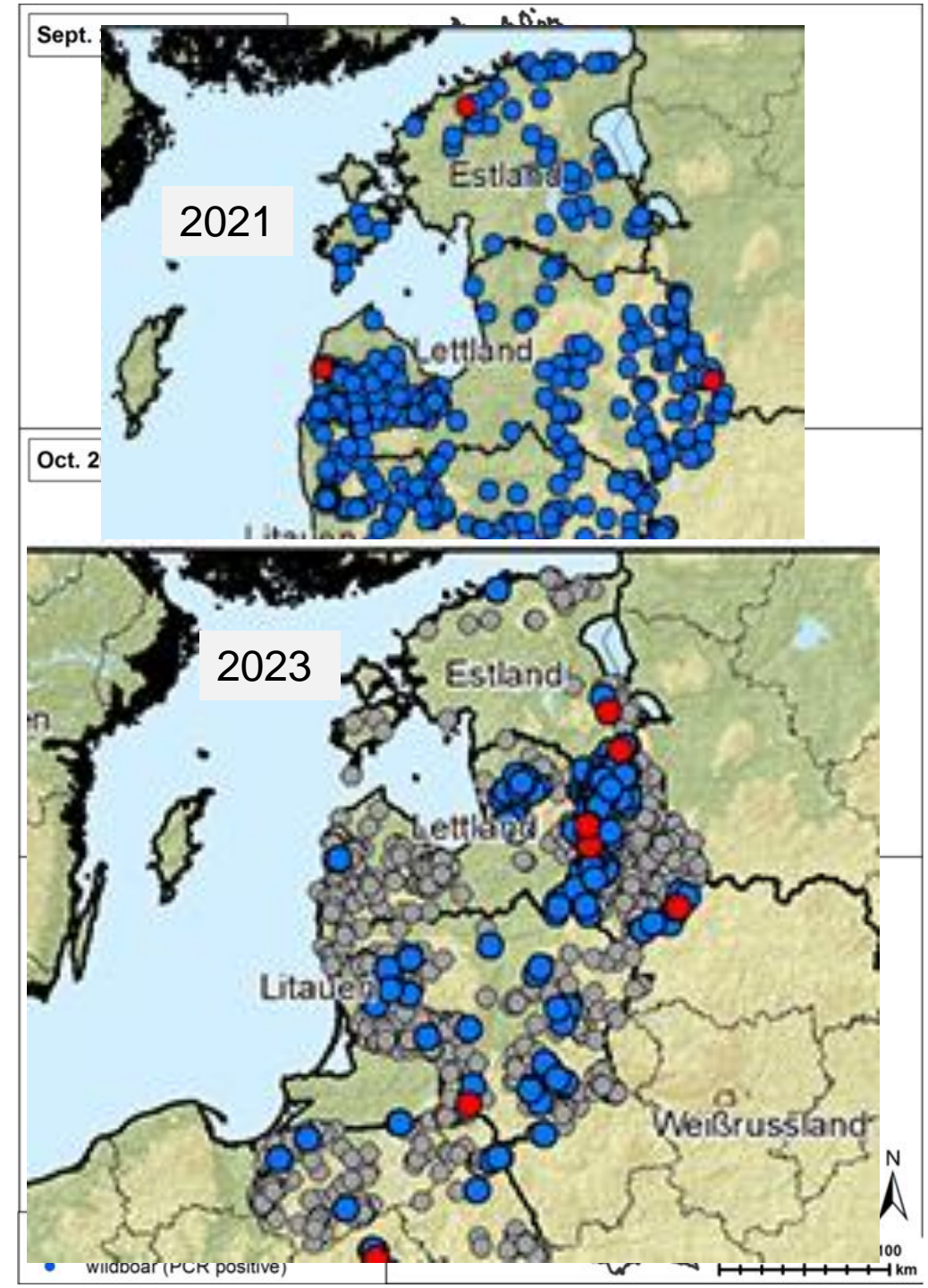


# Domestic pig outbreaks

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Nurmoja et al. 2020



# Hazard analysis

Herd size category	No herd years (No OB)	Hazard ratio (HR)	P-value	95% CI for HR
1-10	607 (8)	1	X	X
11-100	185 (1)	0.36	0.342	0.05..2.92
101-1000	90 (5)	4.22	0.013	1.36..13.14
>1000	220 (12)	4.31	0.002	1.72..10.80

Nurmoja et al. 2020

# Suspected causes of virus introduction

- Lack of biosecurity (no disinfection barriers etc.)
- Errors in execution of biosecurity procedures (introduction by fomites)
- Inadequate disinfection of vehicles
- Contamination of cereal feed during storage or processing
- Feeding of grass
- Contamination of bedding

# Biosecurity levels of outbreak farms according to herd size

Herd size category	very high	high	moderate	low	very low
1–10	0	0	0	1	7
11–100	0	0	0	0	1
101–1000	0	0	1	0	4
> 1000	2	1	6	2	1
Total	2	1	7	3	13

Nurmoja et al. 2020



# Number of pigs and pig holdings in Estonia in 2014 and 2017

Herd size	2014		2017	
	No of herds	No of pigs	No of herds	No of pigs
<b>1-10</b>	696	2 585	25	83
<b>11-100</b>	121	4 253	37	735
<b>101-1000</b>	34	17 317	24	7 516
<b>&gt;1000</b>	82	384 537	67	278 572
<b>Total</b>	933	408 692	153	286 906

-84%

-30%

# How the farmers reacted

Based on presentation by **Dr Mati Tuvi**, a veterinarian and pig farm manager in a large pig producing company in 2015

# Important routes of introduction to the farm

## THE BIGGEST DANGER – PEOPLE!

- Various behaviours that pose biosecurity risks:
  - **Coming to work with contaminated clothing** or footwear
  - **Inadequate personal hygiene** (such as not washing hands or trimming nails).
  - **Ignoring established farm biosecurity measures** (like sauna, shower, changing clothes/footwear – compliance with veterinary sanitary regulations of the farm).
  - **Bringing prohibited products/items** (especially food) into the production zone.
  - **Ignoring the segregation of zones**
    - people moving in and out of the barn without changing clothes/footwear,
    - tools moving between zones

# Other important routes of infection and mitigation measures implemented

## •Use of infected feed:

- Excluded; currently using 2014 grain, but later we may temporarily suspend or cease our feed production.
- Using “commercial feeds” - all granulated, i.e., heat-treated.
- We will at least temporarily stop using wet grain

## •Use of infected bedding (especially straw and peat):

- the use of sawdust and peat must be stopped until the end of November.
- deep litter farms should use straw from 2014 as long as possible (at least until the end of October).
  - Straw from 2015 must be kept in a sheltered, fenced area.

## •Farm servicing vehicles, which also visits other farms, including drivers:

- vehicles go through a disinfection bath,
- drivers receive disposable shoe covers and disinfect their hands.
- their movement can only occur around the vehicle.

## •Rodents, birds, insects:

- ventilation openings must be bird-proof; work is underway to make all openings rodent-proof.
- A new requirement: the pig loading platform must also be bird-proof



# How to avoid contamination with the ASF virus and its transmission?

- **Avoid going to the forest!**
  - If you can't avoid it, then change all clothes and footwear; avoid their contact with clothes and footwear you wear to work or elsewhere.
  - Be careful not to step on animal excrement, carcasses, or their remains in the forest. If this happens, thoroughly clean the soles of your footwear – NB! in the forest, not at home!
  - Wash your hands thoroughly after returning home, changing clothes, and after handling berries, mushrooms, etc.
- **Do not buy pork or pork products from the farmers market**
  - There is a high probability that the ASF virus is present in pork sold at farmers markets because it mostly comes from small farms.
  - After visiting the market, wash your hands thoroughly.
  - If you have recently bought pork or other meat products from the market and they are in the freezer, boil or fry this meat as soon as possible, as the virus can remain alive for decades in cold conditions

# Measures taken

# Measures taken

- Fencing
- Disinfection barrier at entrance to the farm territory
- Disinfection barrier at entrance to the farm building
  - Changing room with segregated 'Dirty' and 'Clean' areas
- Extra precautions for animal loading door and platform
  - Walls and roofed
  - Segregating inner and outer zone with a physical barrier.
  - Extra disinfection measures
- Loading carcasses to the car of the rendering plant outside of the fenced area

# Major challenges through the eyes of the farm manager

- Fencing
  - how to make the fence animal-proof (cats!)
  - Cost of building and maintenance of the fence
  - What should be considered as area to be fenced (buildings close to roads, slurry tanks?)
- Disinfection
  - Which method should be used (spray or bath or booth?,
  - cost of set up of redesign of disinfection barrier
  - in winter
    - Snow and ice on trucks
    - Temperatures below -10 °C

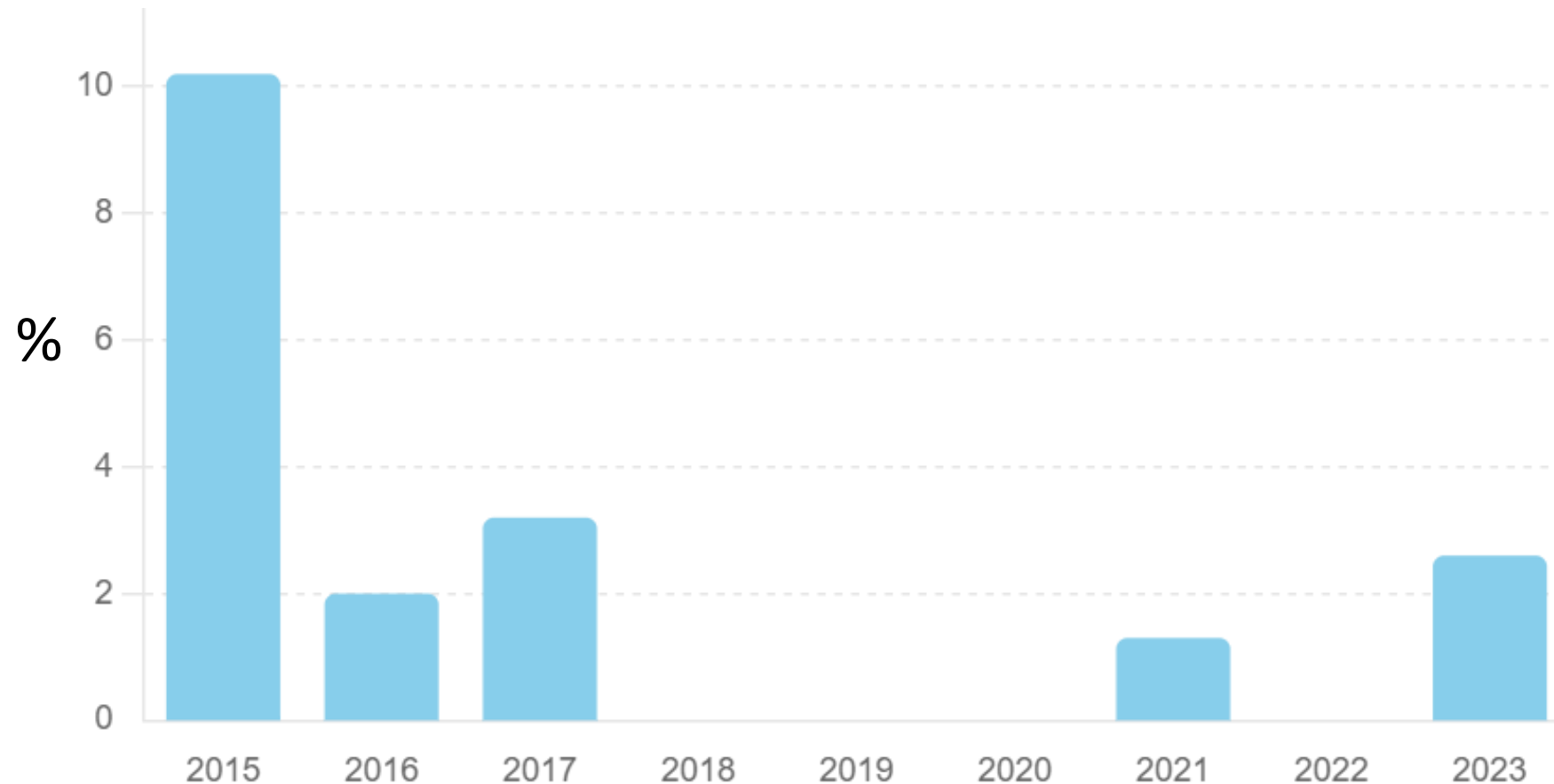


# Major challenges through the eyes of the farm manager

- Compliance by farm workers
  - Ignoring established farm biosecurity measures (like sauna, shower, changing clothes/footwear)
  - Workers moving between “inner-” and “outer zones” without changing clothes/footwear,
  - Tools moving between the clean and dirty zones
- Compliance by service providing truck drivers
  - Drivers are changing all the time, they have not given any instructions regarding BS by the service provider company
  - Multipurpose trucks

# Results

- Practice is the criterion of truth (Francis Bacon “Novum Organum”, 1620)
  - Herd incidence of ASF outbreaks in herds keeping 100 or more pigs



# Conclusions

- With improved biosecurity ~80% of yearly outbreaks could be avoided in commercial farms in Estonia
- The residual 20% (~2% yearly herd incidence) has remained unresolved
  - Do we miss with present biosecurity measures something?
  - ,, or is it the expression of (human) error, non compliance in the system?
  - ... or expression of effectiveness of the system (at least in Estonia)?

# Reference

- Nurmoja, I., Mõtus, K., Kristian, M., Niine, T., Schulz, K., Depner, K. and Viltrop, A., 2020. Epidemiological analysis of the 2015–2017 African swine fever outbreaks in Estonia. *Preventive veterinary medicine*, 181, p.104556.



Thank you for your attention



*A survivor*  
by Seaküla Simson