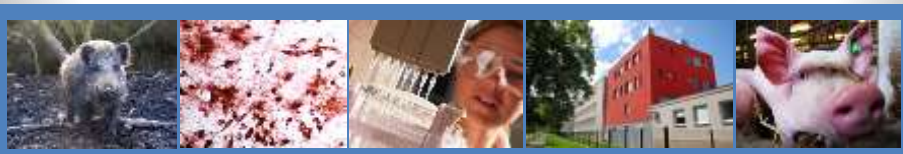
ASF in the Czech Republic: management experience and lessons learnt

Petr Vaclavek

NRL for ASF and CSF, State Veterinary Institute Jihlava

FAO Regional ASF Wild Boar Management Workshop
Belgrade, Serbia, 21-23 May 2019



Content

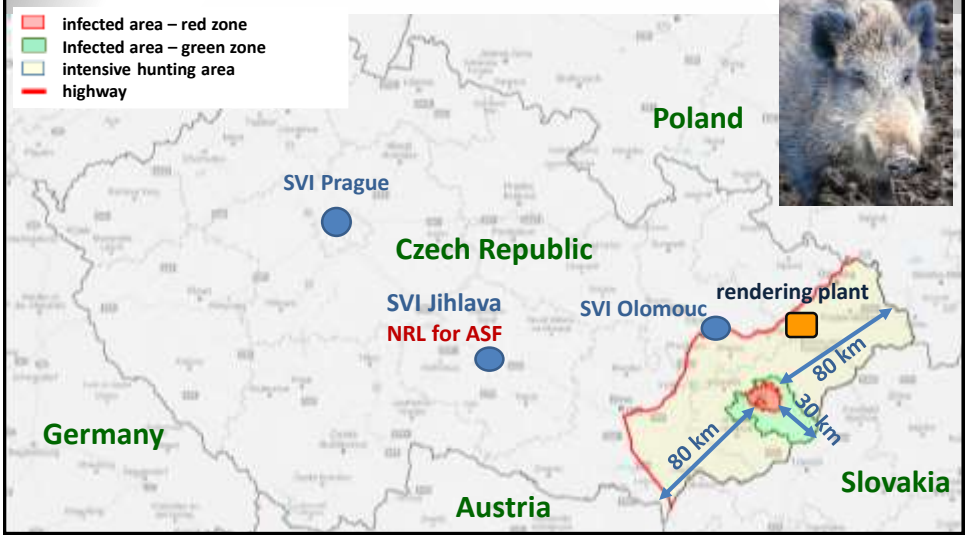
Part I. Management experience and lessons learnt

1) Story of one outbreak – way of introduction?
2) Current epidemiological situation
3) Strategy and measures applied
4) Selected important measures (demarcation, fences, hunting regulation, biosecurity etc.)
5) Conclusions

PART II. Sampling and laboratory diagnostics of ASF in the Czech Republic

Localization of the infected area

- 30 km from the Slovak border
- 80 km from the Austrian border
- 80 km from the Polish border



Pig industry in the Czech Republic

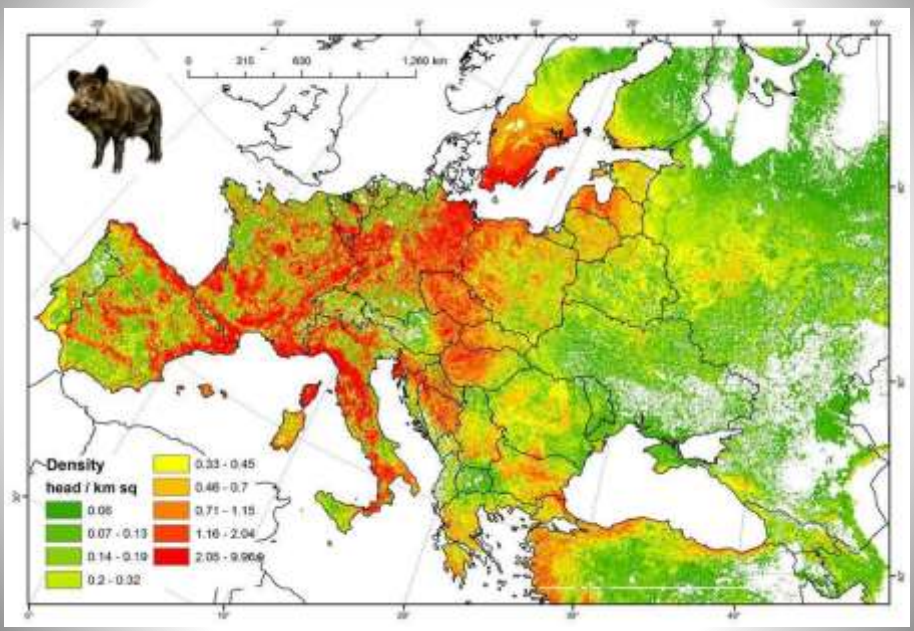
Density of domestic pigs in the Czech Republic (per 100 km^2)

	farms	pigs
Czech Republic	2 160	1 490 775
Zlín region	83	74 088
infected area (district Zlín)	23	16 301

The Czech pig industry:

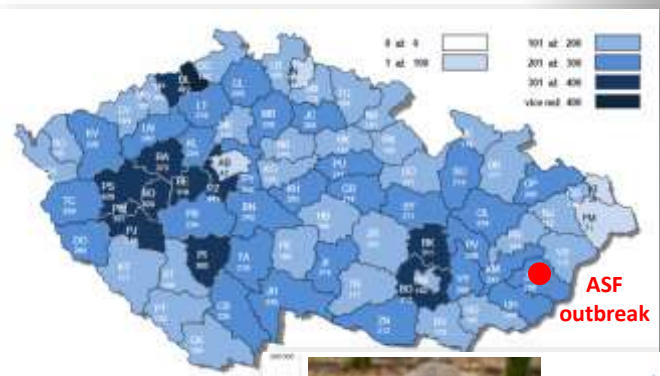
- low frequency of backyard farms
- only about 1,5 mil pigs (92 thousand of sows)
- country is not self-sufficient in pork even 45%

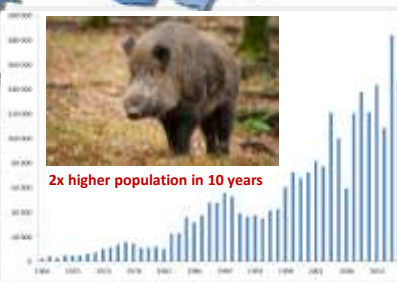
Wild boar density in Europe (FAO/ASFORCE, May 2015)



The density of wild boar population in the Czech Republic (per 100 km2)

Hunting year	Game bags
2010	144 305
2011	109 563
2012	185 381
2013	152 468
2014	169 483
2015	186 148
2016	160 164
2017	229 182
2018	?

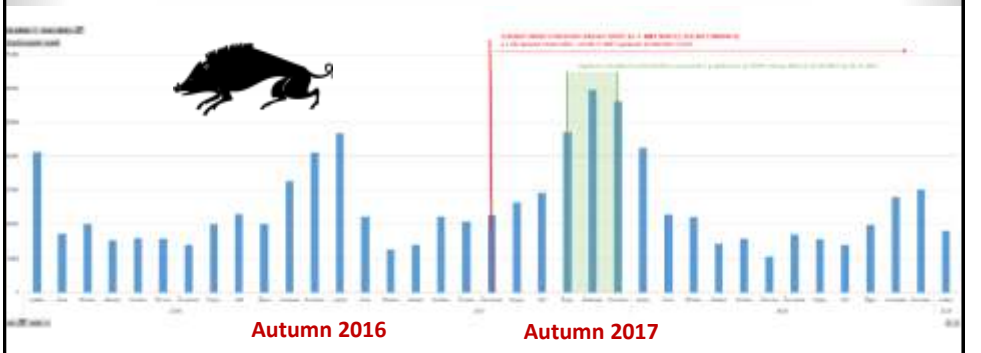




- hunted animals: 1-4 / km2
- real WB density?? = 1,5-2x higher
- the population doubles every 10 years

Motivated hunting in the whole country autumn 2017 (10-12/2017)

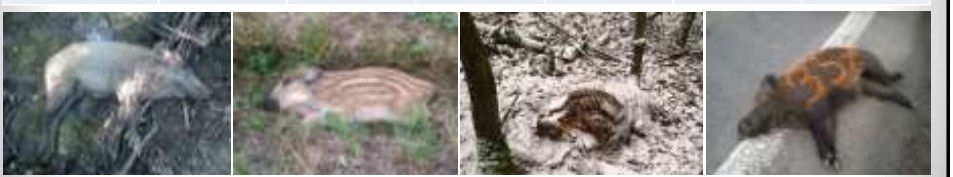
- **reward of 38 EURO per hunted animal**
- this measure resulted in about **20% increasing** in the numbers of game bags
- **this campaign did not meet the initial expectations**



Passive surveillance of WB found dead

Since 2014, all found dead pigs have been tested for ASFV in the Czech Republic

Numbers of WB found dead (including road-kills) **and tested for ASFV in the CR**						
YEAR	3-12/ 2014	2015	2016	2017	2018	1-3/2019
Tested/positive	**243 / 0**	**348 / 0**	**404 / 0**	**1622 / 192**	**1404 / 19**	**275/0**



The **nation-wide passive monitoring**
was the **KEY FACTOR in the EARLY DETECTION of ASF**
and enabled the immediate and effective response

Afterwards: tool to monitore the epidemic (progres, prevalence in time and in space) and finally to demostrate the absence of the virus.

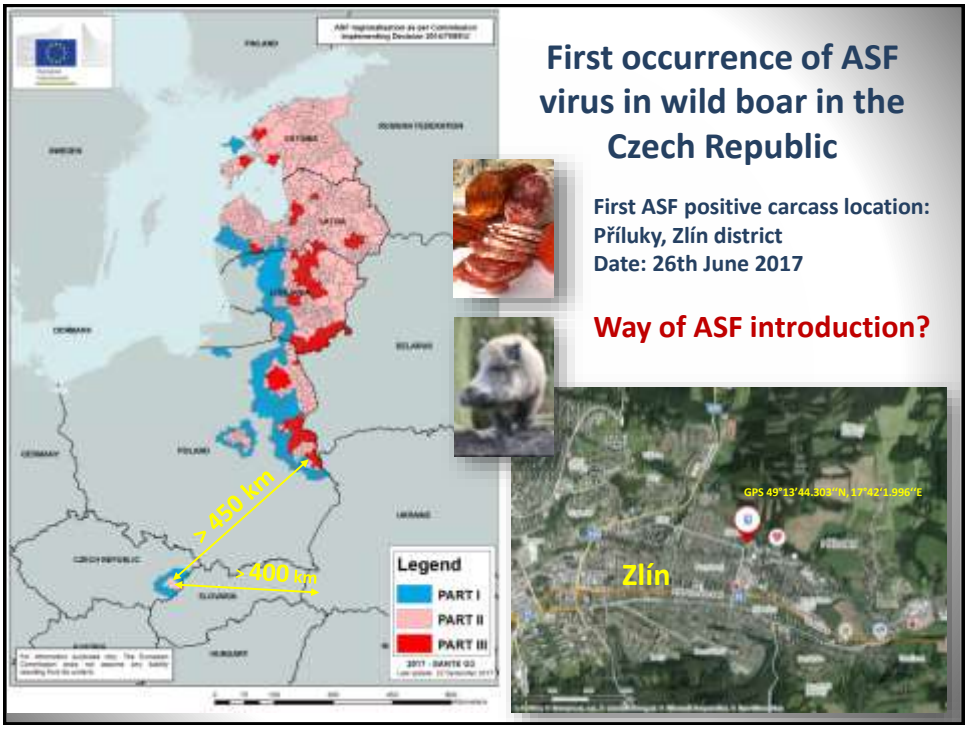
How to increase the passive surveillance of WB?

- **financial compensation** for carcass detection (for hunters) = **crucial**
- defining some **baselines** (on hunting ground level)
- **involvement of general public** (reporting of carcasses)
- making „public“ reporting simple = **mobile apps**

First occurrence of ASF virus in wild boar in the Czech Republic

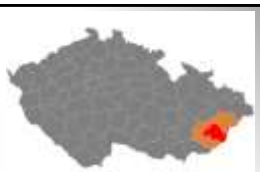
First ASF positive carcass location:
Příluky, Zlín district
Date: 26th June 2017

Way of ASF introduction?



First ASF case in the Czech Republic

- Zlín city - inhabited area
- 1st WB carcasses found nearby the local hospital

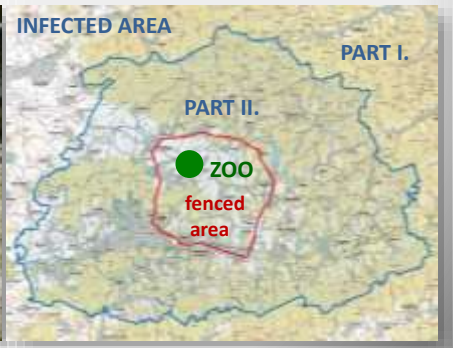


Way of ASF introduction?

Autor: Michal Klíma, MAFRA

Zoological garden inside the high risk infected (fenced) area

- natural hosts and reservoir of the ASF virus: warthogs (*Phacochoerus africanus*) in the infected area

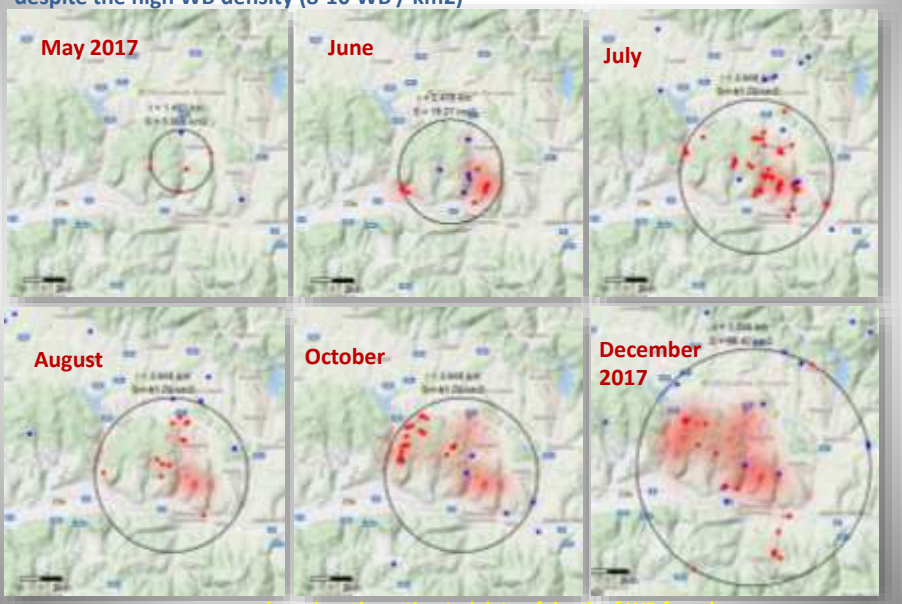


First ASF case in the Czech Republic

The real source of infection?

The rate of disease expansion

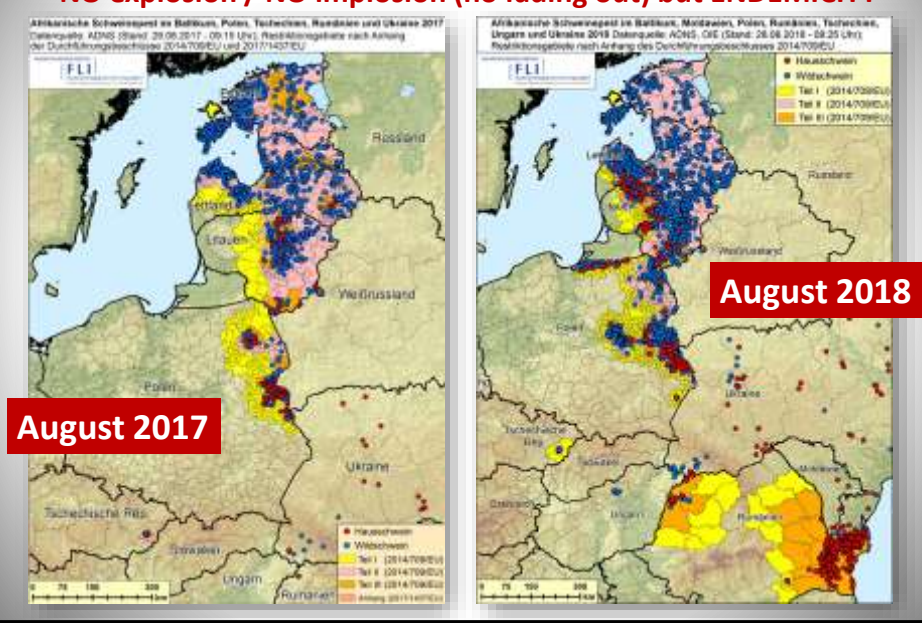
DIAMETER 11 KM (final size) / 6 MONTHS = SLOW speed of spread = Ø 0.5 km / 1 month
despite the high WB density (8-10 WB / km2)



based on the estimated date of death of WB found

SLOW SPREAD = „slowly but surely“

NO explosion / NO implosion (no fading out) but ENDEMICITY



ASF in Czech Republic: current epidemiological situation

from 26 June 2017 to December 2018:

In total 250 cases of ASF in wild boar population

- the total number of positive cases in **found dead WB**: **214** (virus and/or antibodies)
- the total number of positive cases in **hunted WB**: **36** (virus and/or antibodies)

Total number of ASF tested wild boar

Part II: found dead 399 / **214 positive (53,6%)**
hunted 2445 / **36 positive (1.5%)**

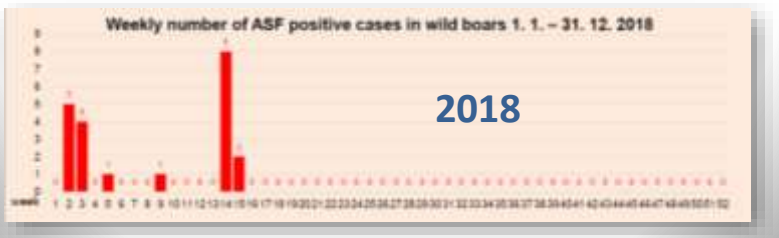
Part I: found dead 185/ no positive
hunted 11641 / no positive

NO OUTBREAK IN DOMESTIC PIGS !

Current situation: last (PCR) positive cases

- **last ASF positive case in HUNTED wild boar**
  8th February 2018

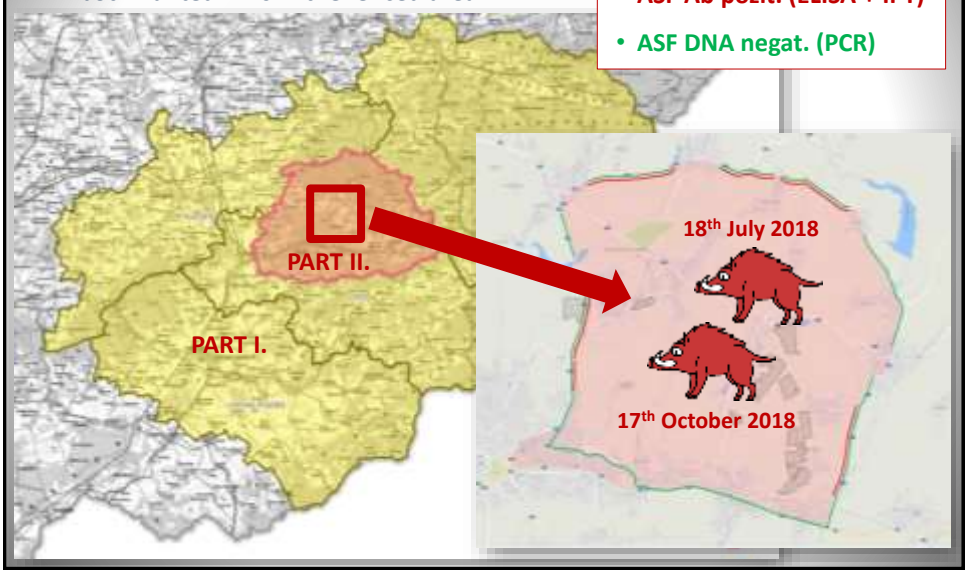
- **2 last ASF positive CARCASSES**
  were found on **15th April 2018**
  - scull and bones
  - estimated death is about
    4-5 months prior to the finding



Current situation: summer and autumn 2018

- 2 last SEROLOGICALLY positive cases in WB
- both hunted WBs in the fenced area

- ASF Ab pozit. (ELISA + IPT)
- ASF DNA negat. (PCR)



Current situation in the Czech Republic

Although the last ASF positive case was detected in the Czech Republic a year ago:

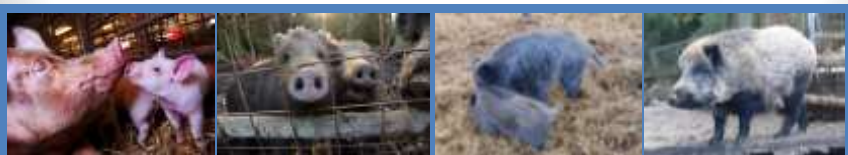
- **searching of wild boar cadavers continues**
- **individual hunting of wild boars in the infected area continues**
- **intensive hunting of wild boars continues in the area with intensive hunting around the infected area**
- **official controls in pig farms continue** – biosecurity, health checks of pigs, laboratory tests, movement control etc.

✓ **NO CASE IN DOMESTIC PIGS**

➢ **MEASURES ARE BEING GRADUALLY CANCELLED NOW**

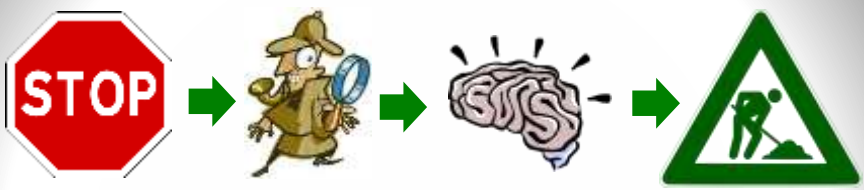
➢ **OUTBREAK HAS BEEN ERADICATED SUCCESSFULLY**

The Czech Republic is the first EU country officially declared free of ASF after the outbreak of infection in recent years.



Strategy and measures applied

Strategy



1. **STOP** of **hunting - keep calm** the area (min. disturbance)
2. **SEARCH** and test **cadavers** - increasing passive surveillance
3. **THINK** - trying to **understand** epidemiological situation, demarcation of the infected area + think about following measures
4. **to DO –** systematically apply **measures**
   - to keep animal at one place (virus works - epidemic phase)
   - to depopulate infected area (at the final stage)

Motto:

Hunting is not a method for eradication of ASF in wild boar population

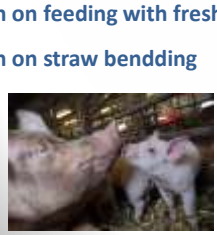
because:

- ✓ **the main source of infection are cadavers that remain infectious for a long time**
- ✓ **the stock of wildboar in the infected area is not precisely known, however relatively high**
- ✓ **lethality of the virus 95%**
- ✓ **low contantagiosity of the virus**
- ✓ **persistence of the virus in the environment is very long**

General measures for DOMESTIC PIGS in the infected area (part II)

TARGET: INCREASE BIOSECURITY AND AVOID CONTACT BETWEEN WILD BOAR AND DOMESTIC PIGS

- **enhanced passive surveillance in pig farms** - farmers must **report all sick/dead pigs in the infected area** (all cases are **tested for ASF**)
- **movement of pigs only with authorisation** issued by the RVA for Region Zlín
- **a ban on the use of cereals as feed** for pigs when harvested in 2017 in the infected area; for at least 6 weeks after harvest **(„cereal quarantine")**
- **ban on feeding with fresh grass**
- **ban on straw bendding**



Ban on feeding with fresh grass
ban on straw bendding

General measures for DOMESTIC PIGS in the infected area (part II)

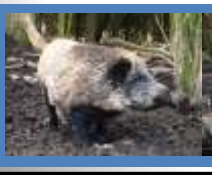
- **ban on entry into a pig farm for all persons who have come into contact with WB** in the previous 48 hours or have participated in **hunting WB** in the infected area
- **ban on keeping of pigs in backyard farms and in non-registered holdings** in the infected area (2017-2018)
- **from 1st November 2018 - registration of farms with 1 pig for home slaughter**
- **official controls** in pig farms in accordance with Commission Implementing Decision 2014/709/EU. Targeted for **BIOSECURITY.**
- **information campaign**

General measures applied in the infected area (part II)

WILD BOARS

- **enhanced passive surveillance of WB found dead** (motivated searching of carcases - each found dead wild boar is rewarded)
- **ban on hunting** (any species, any hunting system) **and later** hunting of WB was allowed but **only by individual hunting and trapping** (selected and trained hunters)
- **ban on WB feeding** (only baiting allowed) **BUT unharvest fields left** to provide food and shelter for wild boars
- **ban of entrance for the general public** into the infected area
- all hunted and found dead WB **must be disposed of in the rendering plant (+ sampling and testing for ASF)**




Some selected important measures

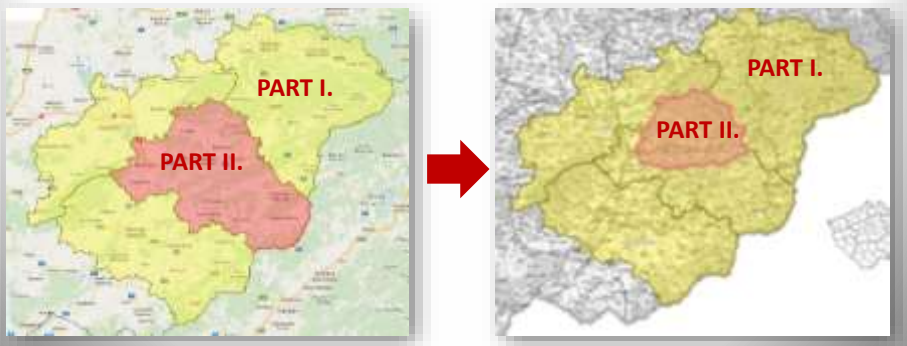
- ✓ demarcation of zones
- ✓ fencing in the infected area
- ✓ hunting policy/strategy
- ✓ biosecurity during hunting
- ✓ intensive organised carcass-searching
- ✓ carcass removal and disposal
- ✓ financial rewards and compensations



Demarcation of the infected area in accordance with the Council Directive 2002/60/EC

- the whole District Zlín has been declared as an infected area (1 034 km^2), 37 municipalities, 89 hunting grounds

Parts according to the EU regionalisation

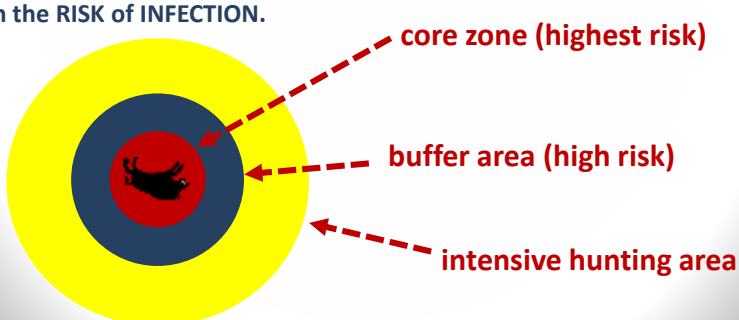


Demarcation of different wild boar management zones

Need to determine:

- **core** (defined by a polygon that encompasses **all ASF positive WB**)
- **buffer area** (based on yearlong **home range**)
- **intensive hunting area**

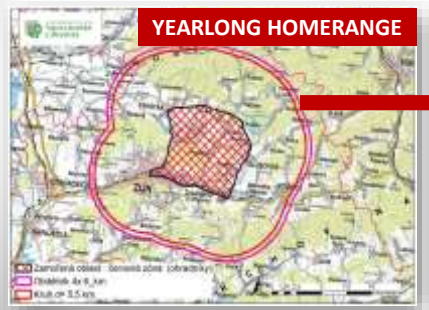
Approaches (and measures) used during the outbreak differed depending on the RISK of INFECTION.



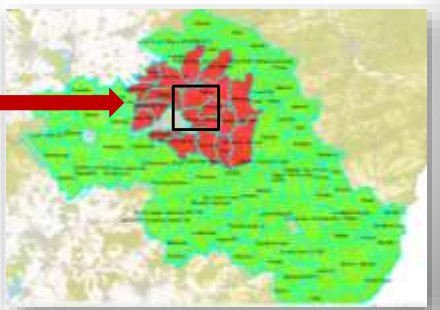
EFSA Journal 2018;16(7):5344 – Scientific opinion – ASF in wild boar

Buffer area = HIGH RISK SUB-AREA

- zone around the HIGHEST RISK SUB-AREA (fenced area, core zone)
- size of the area - 159 km^2
- **it had been calculated considering the maximum annual home ranges of these sounders of wild boars living in the fenced area**
- **home ranges were discussed WITH SOME EXPERTS AND LOCAL HUNTERS**



The **HIGHEST RISK AREA (red grit, fenced area, core)** surrounded by the perimeter of the wild boar maximum home range size.

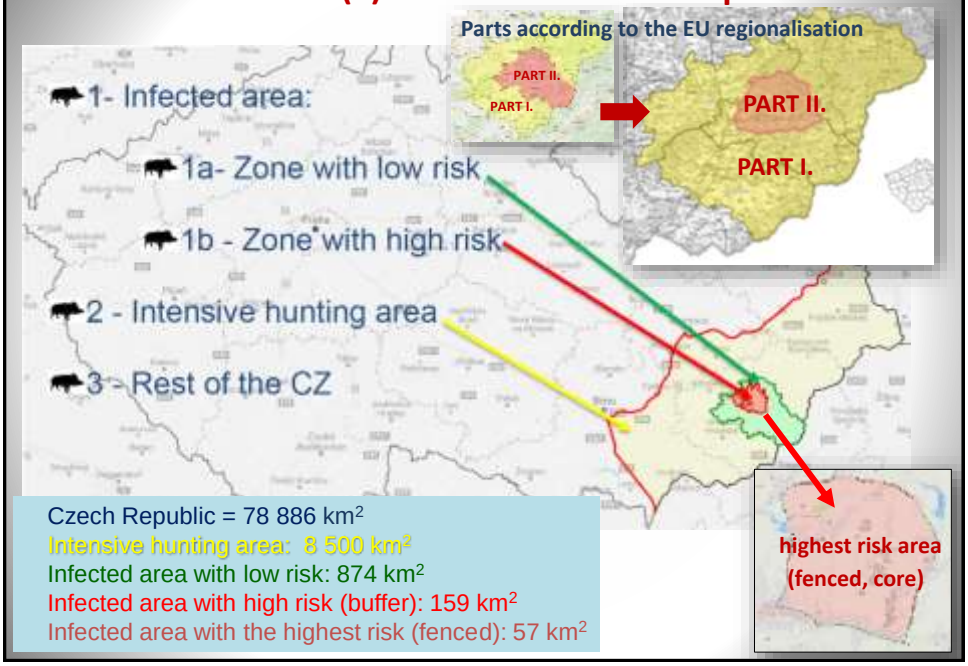


The **LOW-RISK SUB-AREA (green part** - 874 km^2) and **HIGH RISK** (buffer) and **HIGHER RISK** (fenced, core) area (**red part** – 159 km^2)

Demarcation of the intensive hunting area

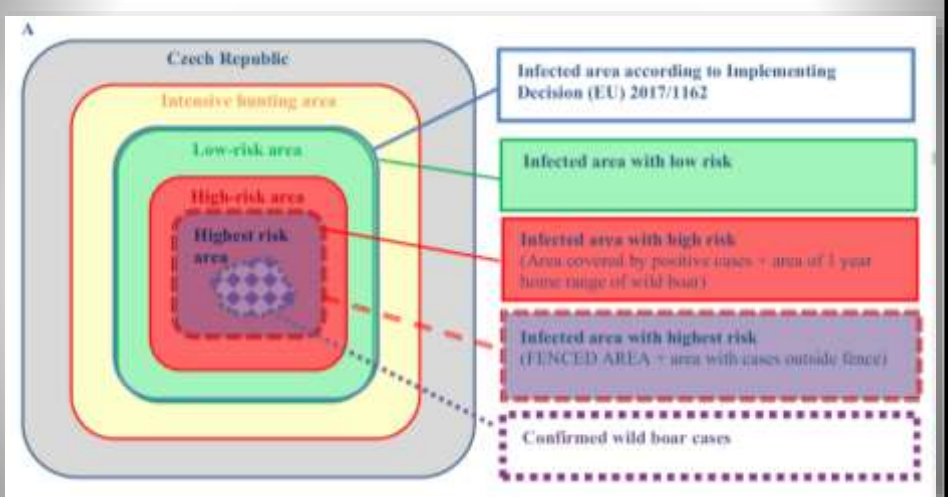
defined/demarcated by the layout of highways

ASF measures in 4 (5) levels in the Czech Republic



Czech Republic = 78 886 km^2
Intensive hunting area: 8 500 km^2
Infected area with low risk: 874 km^2
Infected area with high risk (buffer): 159 km^2
Infected area with the highest risk (fenced): 57 km^2

ASF measures in 4 (5) levels in the Czech Republic



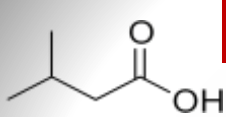
EFSA Journal 2018;16(7):5344 – Scientific opinion – ASF in wild boar

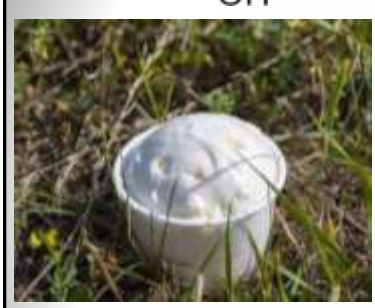
Electric fences around the infected area

https://www.kr-zlinsky.cz

Luděk Ovesný - MAFRA

Scented fences around the infected area

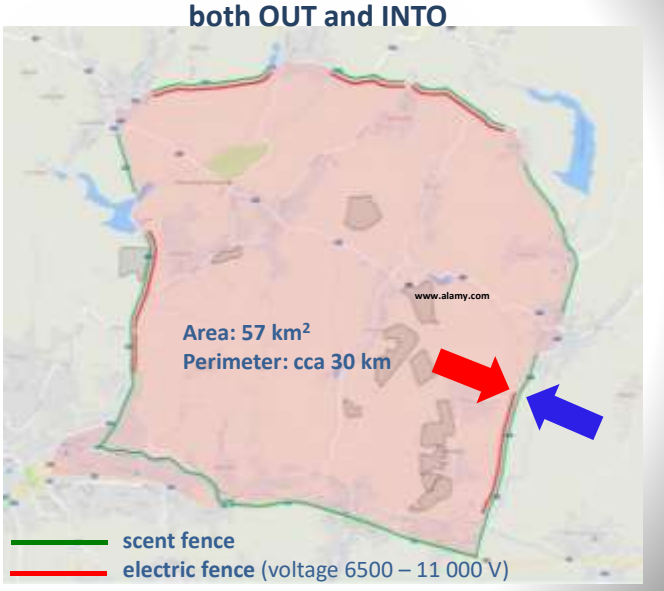




- synthetic foam with **3-Methylbutanoic acid (isovaleric acid)**
- **imitation of typical predators smell /odour**
- **strong pungent cheesy or sweaty smell**
- it is a major component of the cause of unpleasant foot odour
- most durable product chosen – resistant against weather conditions (+ with slow evaporation)
- 5 m distance / 4 weeks period
- product: *Pacholek koncentrát B, Ekoplant, s.r.o.*

Fences around the highest risk sub-area

to prevent or complicate the WB migration both OUT and INTO



Fences around the highest risk sub-area

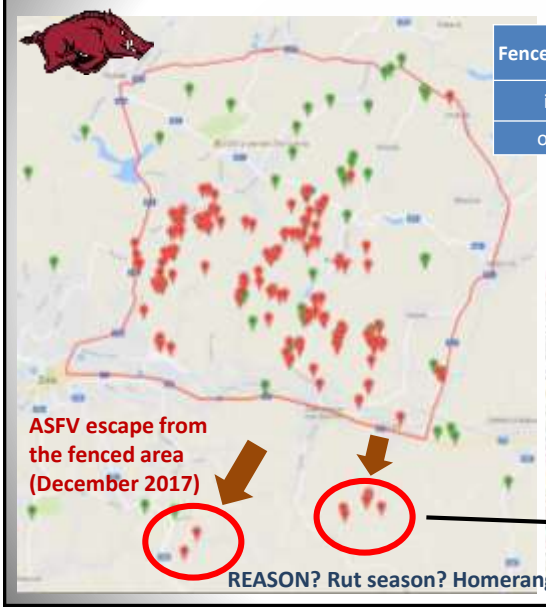
to prevent or complicate the WB migration both OUT and INTO

Photo: RITZAU SCANPIX/Reuters

Photo: Morris MacMatzen/Getty Images

All positive cases were in PART II.

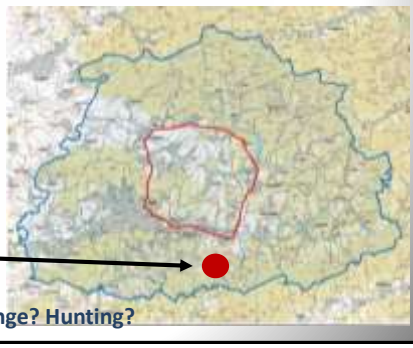
Only once disease spread out of the fenced area (December 2017) – 11 cases



Fenced area	total	negat.	posit. (virus/PCR)	prevalence
in	280	79	201	71,7%
out	134	123	11	-

21 May 2018

WB density in the fenced area:
more than 520 (found dead+hunted)
WB / 57 km2 = 9.1 WB per 1 km2



How to estimate the number of WB

EXTERNAL SCIENTIFIC REPORT

ENETWILD

APPROVED: 3 July 2018

doi:10.2903/sp.efsa.2018.EN-1449

Guidance on estimation of wild boar population abundance and density: methods, challenges, possibilities

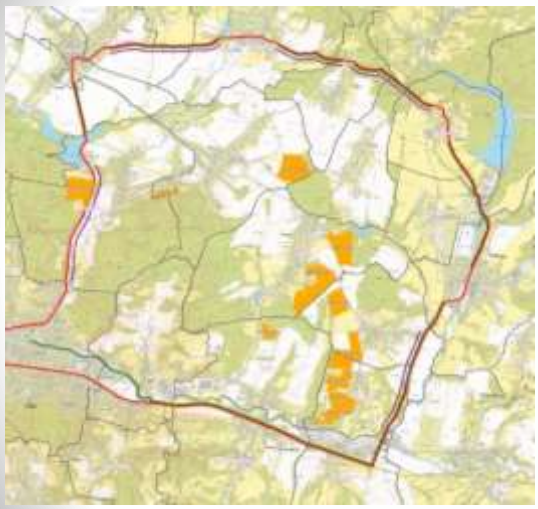
ENETWILD consortium[1], Oliver Keuling, Marie Sange, Pelayo Acevedo, Tomasz Podgorski, Graham Smith, Massimo Scandura, Marco Apollonio, Ezio Ferroglio and Joaquin Vicente

How to estimate the number of WB in the highest-risk area (fenced area) and current situation

- **INITIAL ESTIMATE (July 2017) was 150 – 200 (250 max) wild boars only**
- **TOTAL NUMBER** of hunted or found dead wild boars was **582** as of 17/9/2018 (299 hunted; 283 found dead)
- **last estimates** were made in July - August 2018 using trail cameras (game cameras), infrared thermal visions, and also by watching by hunters. The total **estimated number of pigs was 15-20** (August 2018), only individual wild boars were observed.



Highest risk area (fenced area) - unharvested fields left



115 hectares of unharvested fields (rape, maize and wheat) were left for wild boars providing both food and shelter

To hunt, or not to hunt, that is not the question.

When? Where? How? Who?

Evolution of hunting in the core nad buffer area:

ban on hunting → sit-and-wait hunting → intensive hunting

- in September 2017 **individual hunting by local hunters allowed** in the high-risk sub-area including the fenced sub-area (driven hunts still forbidden)
- under strict biosecurity measures
- **only trained hunters** - more than 1300 hunters trained by SVA

RESULT: the hunting by local hobby hunters and gamekeepers was too slow to have any immediate effect on the size of the population

Timeline of hunting regulations

26 June 2017
ASF confirmation

→

27 June 2017
Ban on hunting in the infected area

21 July 2017
Hunting in the low risk zone in infected area

→

24 August 2017
Trapping of wild boar in the high risk zone in infected area

11 September 2017
Individual hunting in the high risk zone in the infected area

→

16 October 2017
Hunting in collaboration with Police

Trapping of wild boars

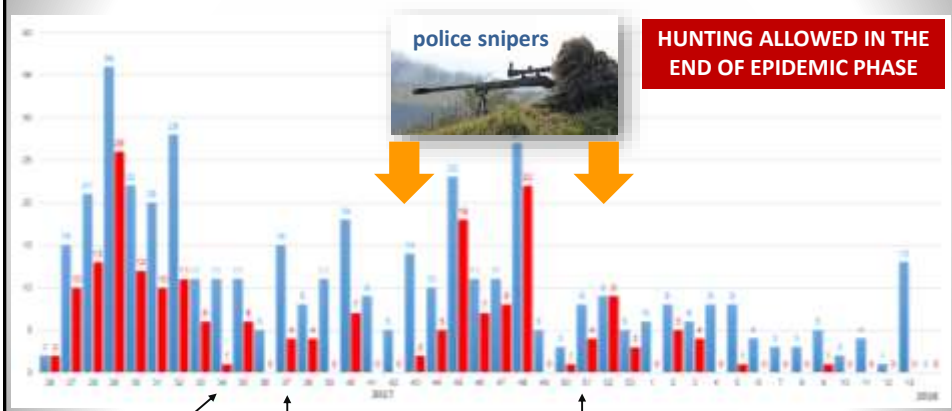
- 32 traps in the area
- cage traps with sensors and cameras
- subsidies for traps = 315 € - 730 €

Fenced area	total trapped	negat.	posit.	prevalence
in	40	36	4	10%
out	66	66	0	-

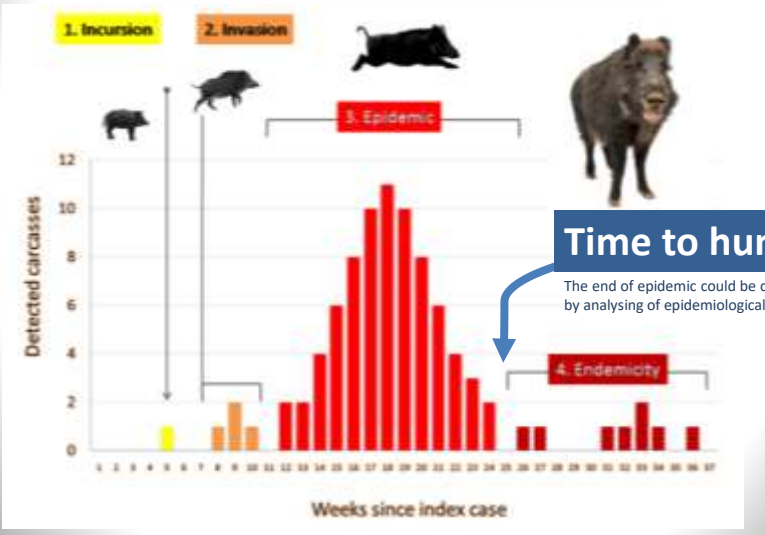
Weekly incidence in relation to hunting measures

number of WB found dead

number of ASF PCR positive found dead WB



Timing of hunting regarding to phases of the infection dynamics in a population of WB



© GF-TADs Handbook on ASF in wild boar. 2018

Hunting by police snipers in the infected area

Target was to depopulate the fenced off area as quickly, silently and efficiently as possible + with high biosecurity

- **individual hunting by Police snipers (Elite Squad, Police Special Unit, Airport snipers)**
- started from **16 October 2017 (**3 days a week during 10 weeks)
- **in total 157 WB hunted - 8 positive for ASF**
- snipers trained for hunting **biosecurity**
- organization and coordination by RVA and by local hunters

- over night hunting (18:00 – 6:00)
- **mobile thermovision** used
- snipers with **silencers**

ALL hunted WB collected and rendered !!!

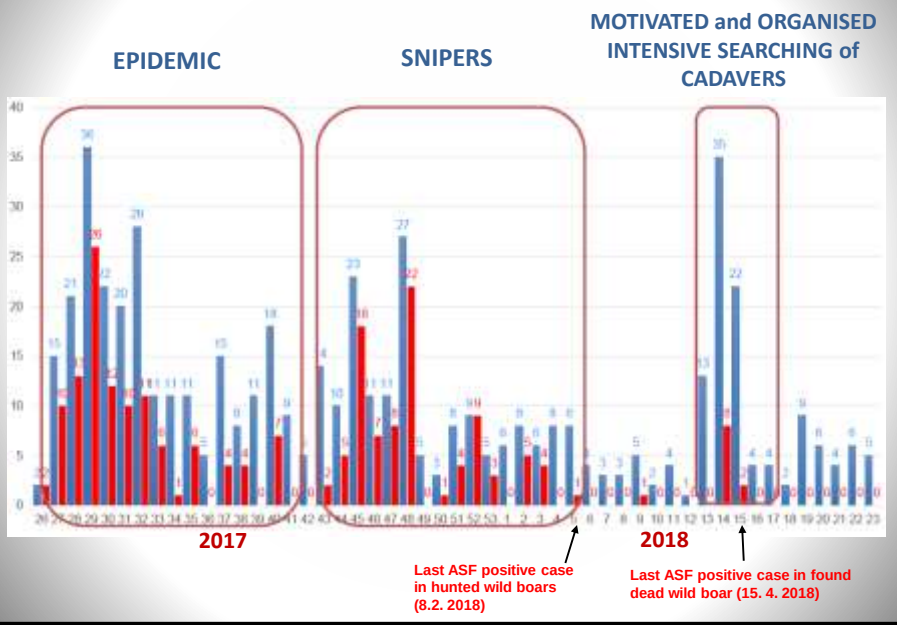
Training of snipers

on a moving target




Hunting by police snipers in the infected area

Weekly incidence: 3 peaks in the Czech Republic



Biosecurity during hunting

- e.g training of hunters on ASF preventive and biosecurity measures
- wild boar transportation from the hunting spot to the dressing facility (ban on transporting hunted animals in private cars)
- dressing room / area requirem… equipment
- proper disposal of … biosafety cont…
- safe o… …d wild boar
- …ve
- …the disposal of ASF virus
- …ild boar
- …ocedures for cleansing and disinfecting facilities, etc.

OR you can skip majority of above mentioned measures by compulsory disposal of all hunted wild boars in the rendering plant.

Carcass detection and removal

- Organised by SVA and **LOCAL HUNTERS (searching)**
- **carcass detection** is the most important tool to **detect geographical spread** in WB
- **carcass removal** (including sampling and safe destruction) is essential to reduce transmission in the infected areas

TARGET:

- **enhanced passive surveillance**
- **minimize risk of local ASFV persistence**
- **minimize risk of indirect transmission**

Enhanced passive surveillance of WB found dead

Motivated or/and organised searching of carcasses

- very inaccessible terrain
- dense vegetation

Carcass removal and disposal

ALL found dead and hunted animals were collected under STRICT BIOSECURITY MEASURES

- **marked** with hunting seals number
- **transported** into specific wild boar **collection centres**
- **dispatched with authorized vehicles** to a **rendering plant**
- **sampled** by an official veterinarian and then **disposed**



Collection and disposal of hunted wild boars






Collection of hunted WB during hunting by POLICE





Disposal of hunted wild boars from the infected area in selected rendering plant

Secure boxes for the collection of material for rendering

Positive BIOSECURITY measure , BUT influence the sample quality = LAB RESULT

Sampling of WB from the infected area

NOT in the field!! But ONLY in the rendering plant or in the lab.

- **IMPORTANT BIOSECURITY MEASURE!!!**
- both found carcasses and hunted WB transported into the rendering plant
- samples collection - **authorized veterinarian samples carcasses**
- **DISPOSAL OF CARCASSES IN A RENDERING PLANT**

Financial rewards and compensations

financial motivation gradually increased

Financial rewards for infected area:

- each finding of **dead wild boar – ~~117, 156,~~ 194 €**
- each **hunted young wild boar (up to 50 kg) – ~~117,~~ 155 €**
- each **hunted adult wild boar (over to 50 kg) - ~~117, 156,~~ 310 €**

Financial rewards for intesive hunting area:

- each finding of **dead wild boar – ~~39,~~ 117 €**
- each **hunted wild boar – ~~39,~~ 78 €**

Rest of the country:

- each finding of **dead wild boar – ~~39,~~ 78 €**

+ Compensation for **hunted wild boar disposed of in the rendering plant** - piglet **39 €**, one-year old **78 €**, adult saw **125 € for**

Summary: What did we learn from our small outbreak?

The best rated measures (effectiveness and practicality):

- ✓ **demarcation of management zones** - based on risk of the infection
- ✓ **motivated passive surveillance** – fast systematic searching and removal of carcasses
- ✓ **ban on driven hunting** (despite public/hunters opposition and political pressure)
- ✓ **high hunting biosecurity + biosecurity of sampling** (lab + rendering plant)
- ✓ **disposal of hunted wild boars from the infected area** – (rendering plant)
- ✓ **motivation for hunters** (financial rewards and compensations)
- ✓ **effective hunting in the infected area** (depopulation by snipers)
- ✓ **awareness + training + education** (hunters, veterinary service, public)

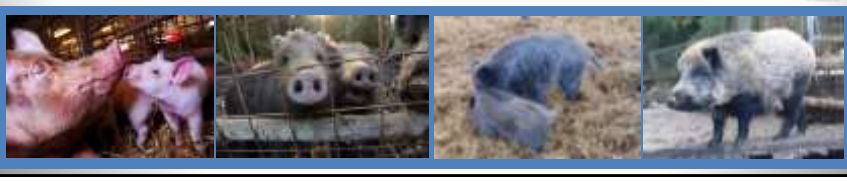
Recommendations

- **passive surveillance plays the key role for early detection**
- **hunting is not a method for eradication** of the disease
- **hunting is applicable at the final stage of the epidemic phase**
- **hunting in infected area is possible only under biosecurity conditions**
- **to minimize the migration of pigs from infected areas, it is possible to use electric and /or scent fencing, restriction in entrance for the public, leaving some crops unharvested**

Conclusions

- ✓ by implementing of strict measures (in the small isolated area of the outbreak) the **HUMAN FACTOR HAS BEEN SUBSTANTIALLY REDUCED** in the Czech Republic.
- ✓ **responsible authorities took both PIONEERING AND ALTERNATIVE MEASURES**
- ✓ **the COMBINATION of measures applied resulted in very LIMITED SPREAD**
- ✓ possibility to apply some of measures due to the **small size of infected area**
- ✓ **MEASURES WERE CONTINUOUSLY BEING ADJUSTED to the epidemiological situation**

Key point is collaboration of all stakeholders !!!!



Thank you for your attention.