[JAPAN]

Member's updates on the main diseases in domestic swine population

-ASF prevention, CSF(Session 3), PRRS, PED

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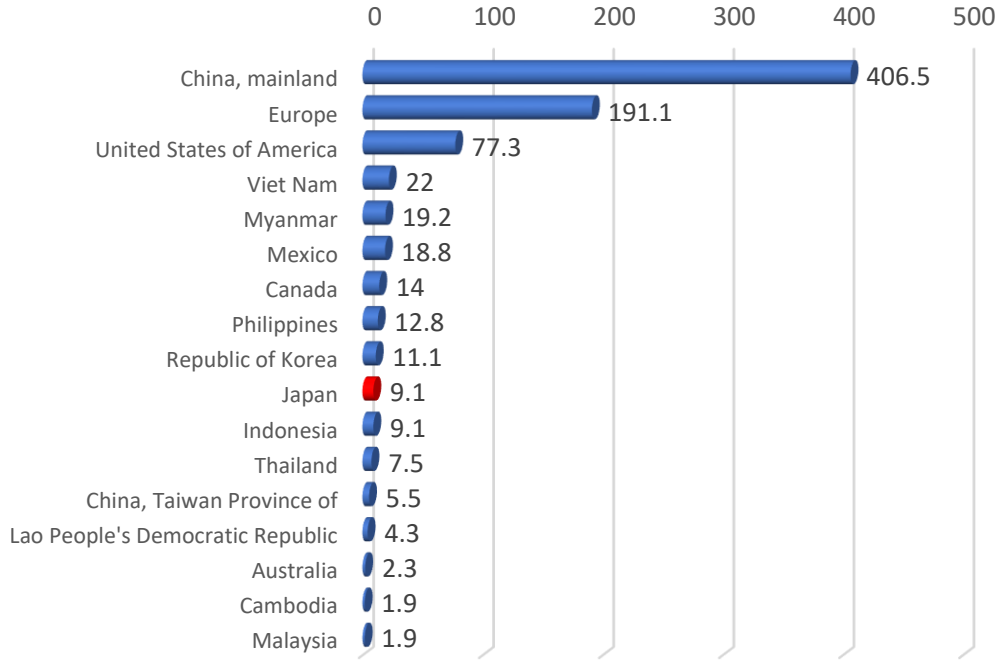
World Organisation for Animal Health
Founded as OIE

MAFF
Ministry of Agriculture, Forestry and Fisheries

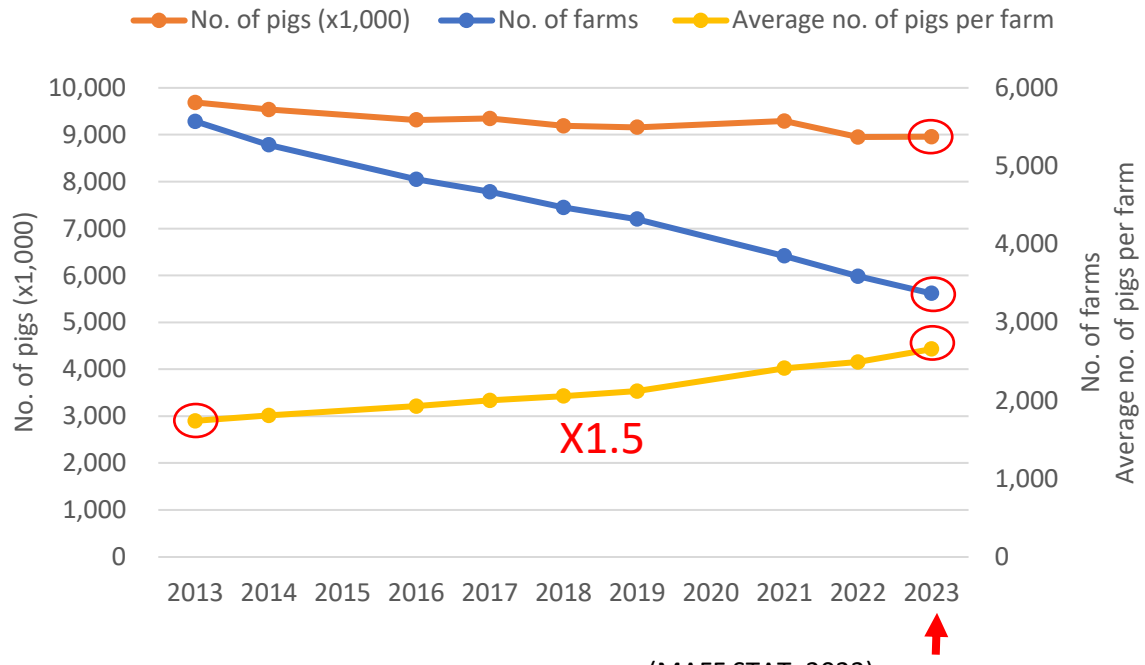
NARO
National Agriculture and Food Research Organization

Member's profile

- *Pig population in Japan:*
  - *Japan ranks in **Top 10 pig rearing countries** in the world (FAO stat., 2020)*
  - ***Total 8.9 million live pigs** in **3,370 farms**, average 2,657 pigs/farm (MAFF, 2023)*
    *Pig farming has been **intensified** in the past decade (**x1.5 pigs per farm**)*
  - *Most farms are industrialized and 65% are operated by corporations (MAFF, 2021)*



(FAO STAT, 2020)



(MAFF STAT, 2023)

Collaboration mechanism for pig disease control

MAFF Ministry of Agriculture, Forestry and Fisheries

NARO National Agriculture and Food Research Organization

Disease Control
- Quarantine - border control
- Surveillance and monitoring
- Disease control guidelines
- Farm biosecurity standards
- Daily observation and early report

Surveillance
- CSF and ASF in wild boars (MAFF)

Monitoring
- CSF immunization levels (MAFF)

WOAH & FAO

Ministry of Agriculture, Forestry and Fisheries (MAFF)
- Budgeting
- Set **disease control guidelines** and **farm biosecurity standards**
- Planning of **surveillance** and **monitoring**



Animal Quarantine Service, MAFF
- **Inspection** and **detention** of pigs & pork
- **Disinfection** for passengers
- Reserving disease containment equipment

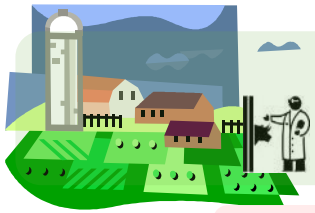
National Institute of Animal Health (NIAH), NARO
- **Research** and **development**
- **Diagnosis** for transboundary disease
- **Surveillance**

Prefectural government Animal Hygiene Service Center
- **Supervise farm biosecurity**
- **Preparation for disease containment**
- **Surveillance** and **monitoring**
- **Diagnosis** for endemic diseases

Hunters
- Hunting and sampling for **surveillance**







Swine farms
- **Daily observation and early report**
- Implementing **biosecurity protocols**
- **Preparation for disease containment**



Private assay companies
- Microbial and serological assay for **health monitoring**



Response to disease incursion:
African swine fever (ASF)

- ***Import ban*** *and*

  Enhanced border control *notably, awareness raising, increase of fine and detector dogs*

  Smuggled pork/pork products in hand carried luggage

  → *Mainly from southeast and east Asia (AQS,2022); Total 109* ***TESTED POSITIVE*** *with PCR and 4* ***VIRUS*** *strains were* ***ISOLATED*** *(AQS, 10, 2018 - 2.2023, n = non-published)*

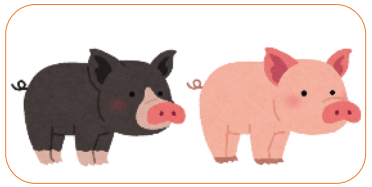
  → *Focusing inspection for higher risk luggage*

- ***Surveillance:*** *PCR including duplex RT-qPCR for CSF & ASF*

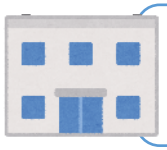
  Dead & captured wild boars: 13,173 (in JFY 2021) → ***ALL TESTED NEGATIVE***

  Domestic pigs for disease diagnosis: 2,195 in 531 farms (in JFY 2021) → ***ALL TESTED NEGATIVE***

- ***Response:***



- Report of abnormal pigs
- Restriction of movements



Prefectural government

- Sampling
- Collect farm history
- Prepare for the action (e.g. culling, disposal)



NIAH

National Institute of Animal Health

- Virus detection
- Virus isolation
- Sequencing

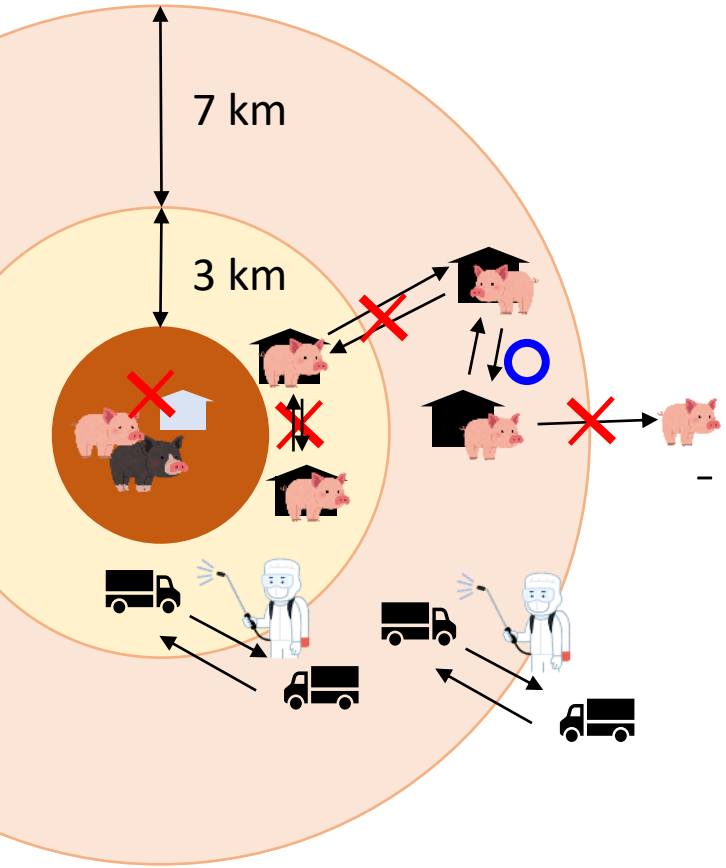


MAFF

Ministry of Agriculture, Forestry and Fisheries

- Make the final decision of diagnosis

Response to disease incursion: ASF



- ***Control and Containment*** *- immediate response*
  - *Affected farm*
    - *Completion of the cull within 24 hours and of the incineration/ the burial within 72 hours*
    - *72 hours traffic control/blockade*
    - *Disposal of byproducts and contaminated materials*
    - *Disinfection, vector/pest control of the premises*
    - *Identification of the contact animals, pig price evaluation ….*
  - *Surrounding farms /zones*
    - *Movement & shipment restriction (⌀3km & ⌀10km) of pigs and risk materials*
    - *Clinical checks and viral (PCR) tests within 24 hours (⌀3km zone)*
    - *Disinfection of vehicles on the main roads*
    - *Checking of biosecurity measures, testing of local wild boars….*

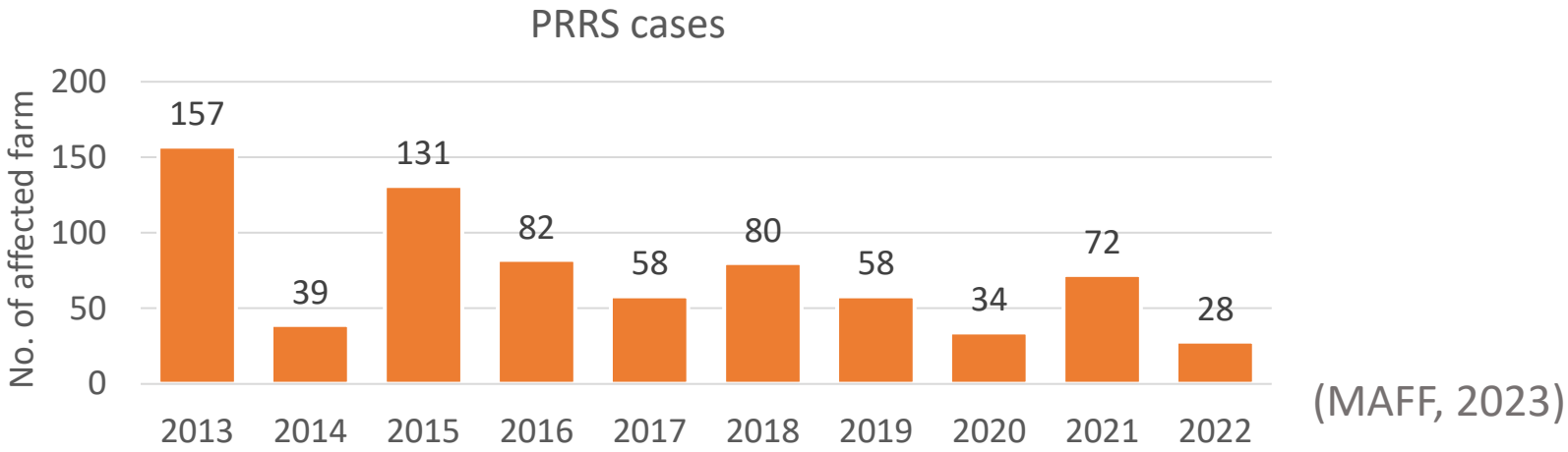
Source: Guidelines for the control of ASF, MAFF, July 2020 (In Japanese)
https://www.maff.go.jp/j/syouan/douei/katiku_yobo/k_bousi/attach/pdf/index-19.pdf

Laboratory capacity for viral diseases

	Major swine disease in domestic pigs *(PRRSV, PCV2, SIV, PEDV, TGEV, RV, ADV, JEV, PPV)*			***Transboundary disease*** *(CSFV, ASFV, FMDV)*			
	Private companies	***Prefectural government***	***NIAH (BSL2)***	***Private companies***	***Prefectural government***	***AQS (BSL3)***	***NIAH (BSL3)***
Rapid Ag test	✓ only for RV	✓ only for RV	✓ only for RV	×	✓ only for FMD	✓ only for FMD	✓
PCR	✓	✓	✓	×	✓ only for ASF&CSF	✓	✓
ELISA	✓	✓	✓	×	✓ only for CSF	✓ only for CSF	✓
Virus isolation	×-▲	▲	✓	×	×	✓ only for CSF&FMD	✓
Virus neutralization test	×-▲	▲	✓	×	✓ only for CSF	✓ only for CSF	✓
Molecular analysis	×-▲	▲	✓	×	×	✓	✓
Pathology	×-▲	▲	✓ EM and IHC	×	×	✓	✓

✓: *possible*, ▲: *possible depending on targeted virus*, ×: *impossible*

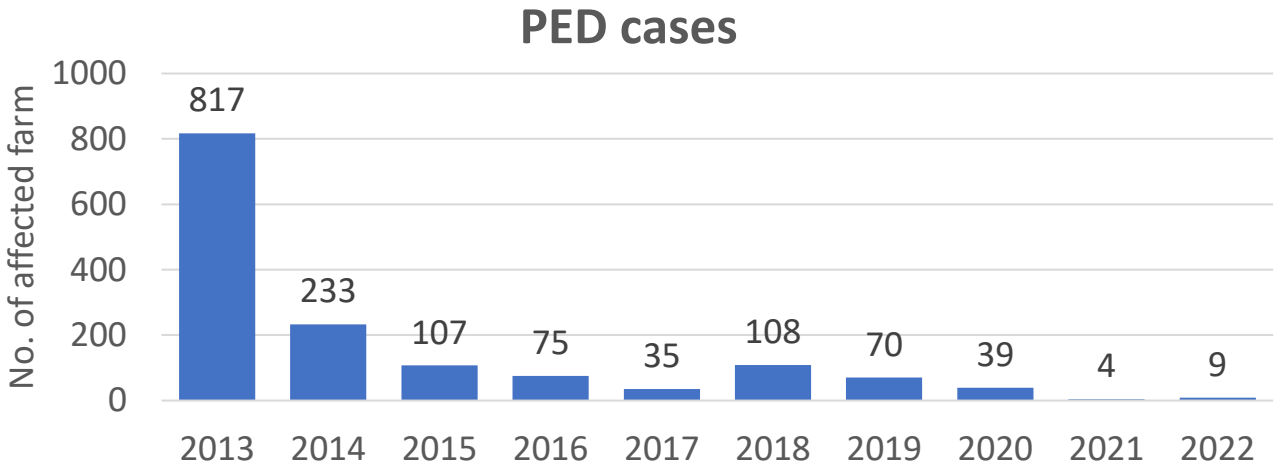
Disease situations：
porcine reproductive and respiratory syndrome (PRRS)



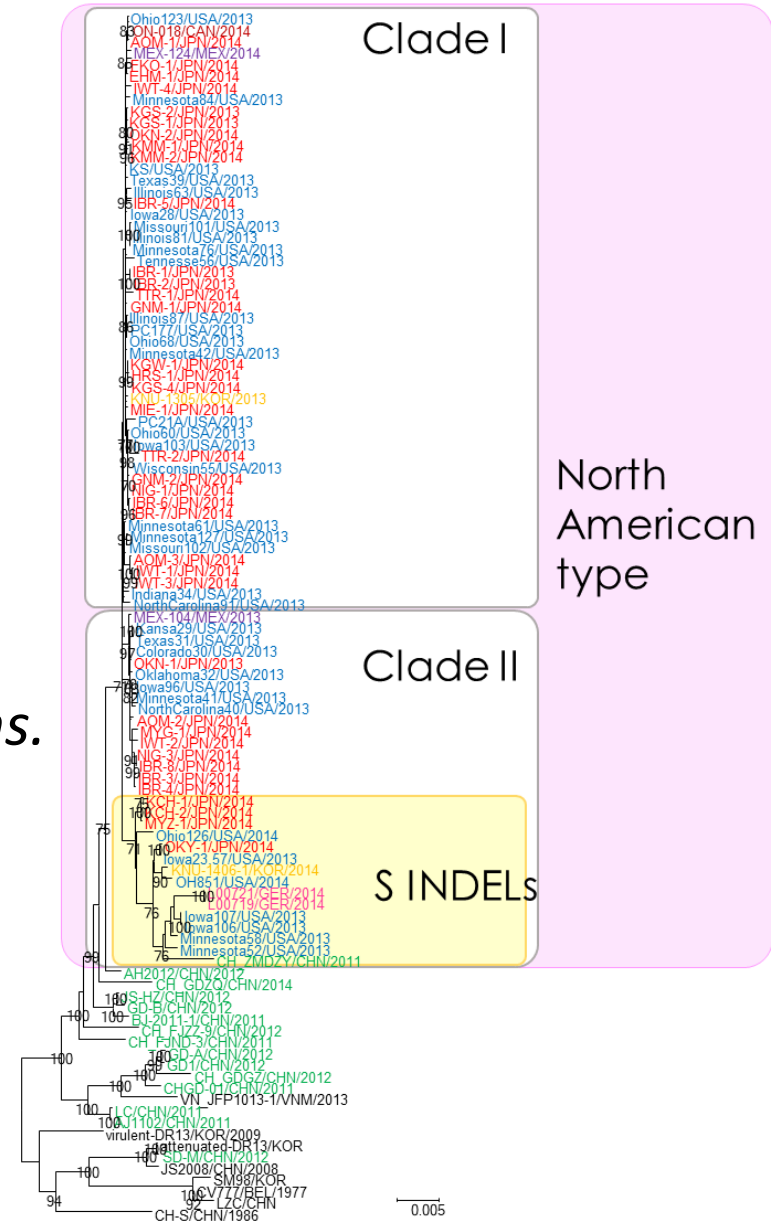
(MAFF, 2023)

- *Disease situation*
  - *PRRSV is free in most GGP and GP farms but is endemic in most commercial farms.*
  - *Reported cases has been declining, but ….*
- *Virus strain*
  - *PRRSV-1 case was only reported once in 2008.*
  - *PRRSV-2 belonging to lineage 4 (Japanese strains), lineage 5.1 (vaccine-like strains), lineage 1 (north American strains) are major strains in Japan.*
- *Prevention and control*
  - *Vaccination (two PRRSV-2 and one PRRSV-1 live attenuated, and one killed vaccines)*
  - *Management (biosecurity, batch-production, pig flow)*

Disease situations:
porcine epidemic diarrhea (PED)



(MAFF, 2023)



- *Disease situation*
  - *PED was epidemic from 2013 to 2014.*
  - *PED cases has been continuously reported in limited regions.*
- *Virus strain*
  - *Virus strains has not been dramatically changed from 2013-2014 outbreak.*
- *Prevention and control*
  - *Vaccination (two live attenuated vaccines for gilts/sows)*
  - *Management (biosecurity, batch-production, pig flow)*

Challenge, possible solutions and future plans

- ***ASF***

  Challenge: Epidemics in E/SE Asia and increase of passengers to Japan

  ➞ *Border control based on refined risk assessment and detention of illegal pork imports*

  ➞ *Improvement of farm biosecurity, depopulation of wild boars, vaccine development*

- ***PRRS***

  Challenge :Vaccine inefficacy

  ➞ *Researches to develop more efficacious vaccine and prophylaxis using new PAM cell lines*

  ➞ *Deep discussion for better vaccine usage*

  ➞ *Genomic breeding*

- ***PED***

  Challenge : Endemic PED

  ➞ *Investigation to identify farms which has endemic PED*

  ➞ *Intervention to stop virus transmission within a farm/ an area/ a region*

  Challenge : Vaccine efficacy

  ➞ *Development of more efficacious vaccine that can induce strong mucosal immunity in sow/gilts and piglets.*

Thank you!



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