The CSF outbreak in Japan

(Single case in Gifu prefecture)

2 October 2018

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OUTLINE of the CSF case

• The outbreak of classical swine fever (CSF) was occurred in Japan for the first time in 26 years.

• First detection of CSF gene from pig sample on 9\textsuperscript{th} Sep 2018.

• Positive results were shown in samples from one pig farm (feeding 600 pigs).

• No other infection have detected in pig farms at present (except for 10 dead wild boars within 10km radius of the affected farm).

• The infection route is still unknown.
The location of the present CSF outbreak

Gifu city
(岐阜市)
Course of the event

7th Sep.: Large number of animals (approx. 80 pigs) has been found dead at the farm. Livestock Hygiene Service Center retested the RFLP and it became positive. Autopsy and sampling was performed in the farm. (From midnight to early morning)

8th Sep.: The samples are transported to National Institute of Animal Health, NARO (NIAH).

9th Sep.: The result of NIAH was FA(-), Pan-pestivirus RT-PCR(+), the nucleotide sequences of CSFV were confirmed from the samples.

→ MAFF concluded that the outbreak of CSF.

10th Sep.: Completion of culling and burying (All the 546 pigs of the farm were culled)

11th Sep.: Completion of disinfection of the farm

12th Sep.: Inspection of “the epidemiological related farms” had implemented.

The epidemiological related farms:
- using the same slaughter house with the affected farm.
- using the same composting center with the farm.
- taken care by the same veterinarian with the farm.

Total 13 farms, tested 216 samples → All RT-PCR negative

14th Sep.: RFLP positive from a dead wild boar found on 13th Sep.

As of 1st October
1 case out of domestic pigs
10 cases out of wild boars
Control and Biosecurity measures

Specific Guidelines for CSF
Published by Minister of MAFF

Biosecurity Standards for pigs
Control Measures against CSF -1

1. Notification of a suspected case from a farm
2. On-site investigation by local veterinary officers at the farm
3. Clinical test, PCR, fluorescent antibody test (FA test)
4. Determination of infected/suspected pigs
   Establishment of Movement (3km radius) and Shipment Restriction (3-10km radius) zones (MRZ and SRZ)
5. Establishment of Anti-CSF Head Quarters of MAFF
Control Measures against CSF -2

Establishment of Anti-CSF Head Quarters of MAFF

<Affected farm>

- Stamping-out
- Disposal of dead bodies and contaminated equipment
- Disinfection

In 24 hours

Survey for all farms in restriction zone (MRZ/SRZ)

Confirming all negative

17 days after completion of all control measures at the affected farm

Survey for freedom of CSF (all farms in MRZ/SRZ)

Confirming all negative

Lift shipment restriction (SRZ)

Confirming no-abnormalities

28 days after completion of all control measures at the affected farm

Lift movement restriction (MRZ)
Clinical inspection

Antigen tests

Virus isolation
- Pos.
- Neg.

PCR
- Pos.
- Neg.

FA (Tonsil, Kidney etc...)
- Pos.
- Neg.

Antibody test (ELISA)
- Pos.
- Neg.

Antibody test (Neutralization test)
- Pos.
- Neg.

Genetic analysis, virus isolation, denying the infection of vaccine strain

NIAH

Confirmed!
- Pos.
- Neg.
Movement Restriction Zone (3km from the farm)

Affected farm

Shipment Restriction Zone (3-10km from the farm)

<table>
<thead>
<tr>
<th></th>
<th>Farm</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>B農場</td>
<td>44頭</td>
</tr>
<tr>
<td>C</td>
<td>C農場</td>
<td>2頭</td>
</tr>
<tr>
<td>D</td>
<td>D農場</td>
<td>966頭</td>
</tr>
<tr>
<td>計</td>
<td>3箇所</td>
<td>1,012頭</td>
</tr>
</tbody>
</table>

3 farms 1,012 pigs
Survey area for wild boars

Survey area for wild boars (10km from composting center)

Survey area for wild boars (10km from the affected farm)

Survey area for wild boars (10km from the dead place)

The affected farm

Dead wild boar

No. of pigs

<table>
<thead>
<tr>
<th>No.</th>
<th>飼養頭数</th>
</tr>
</thead>
<tbody>
<tr>
<td>①</td>
<td>966</td>
</tr>
<tr>
<td>②</td>
<td>44</td>
</tr>
<tr>
<td>③</td>
<td>0</td>
</tr>
<tr>
<td>④</td>
<td>1,919</td>
</tr>
<tr>
<td>⑤</td>
<td>1,940</td>
</tr>
<tr>
<td>⑥</td>
<td>1,890</td>
</tr>
<tr>
<td>⑦</td>
<td>1,274</td>
</tr>
<tr>
<td>⑧</td>
<td>900</td>
</tr>
<tr>
<td>⑨</td>
<td>1,083</td>
</tr>
<tr>
<td>⑩</td>
<td>6,752</td>
</tr>
<tr>
<td>⑪</td>
<td>889</td>
</tr>
<tr>
<td>合計</td>
<td>17,657</td>
</tr>
</tbody>
</table>
Result of surveillance

As of 1 October

Domestic pigs

• Epidemiological related farm (13 farms)
  → All RT-PCR negative (216 samples on 12th Sep)

Wild boars

• In Gifu prefecture
  10 positive / 89 tested (all 10 wild boars were dead and within SRZ)

• In the other prefectures
  ZERO positive / 41 wild boards in 26 prefectures
Phylogenetic analysis of the present CSFV

- The present virus are different from Japanese strains in past and vaccine strains.
- All sequences from pigs and wild boars in the current case are the same.

Fig. Phylogenetic tree of the classical swine fever virus gene
(Red: Gifu strain, Pink: Strain isolated in Japan in the past, Purple: Vaccine strain)
The genotype reported by Postel et al. (Veterinary Research 2012, 43:50) was used as reference. Analysis of the domestic strain and recent Asian epidemic strains was done by the neighbor joining method using a 150 bp of 5' untranslated region (Analysis software: Mega 7.0 Software. Alignment method: Clustal W).
Future and on-going plan -1

Epidemiological survey

• Investigate the possible routes of CSFV introduction into the affected farm

Animal experiment

• Inoculate the isolated CSFV to pigs, and reveal the pathogenicity and antigenicity of isolated viruses.
  → To clarify the reason of FA(-) in our diagnosis.

Full genome sequence

• Determine the full genome sequence of isolated CSFVs and/or CSFVs in tissue homogenates.
  • This may provide additional information for useful epidemiological views and control measures.
Future and on-going plan -2

Development of Guidelines for CSF

• Improve specific guidelines for CSF for future

Reinstate of CSF free status by the OIE

• Stamping-out and disinfection of the affected farm have been completed.
• According to 15.2.6. of the OIE code, Japan expects fulfill the condition to regain the free status on 12 December 2018.

Specific Guidelines for CSF
Published by Minister of MAFF
Thank you for your attention.
### Chronology of CSF in Japan

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1888</td>
<td>1&lt;sup&gt;st&lt;/sup&gt; CSF case was detected in a pig imported from the US</td>
</tr>
<tr>
<td>1969</td>
<td>Attenuated live CSF vaccine was developed and allowed to use in Japan</td>
</tr>
<tr>
<td>1980s</td>
<td>CSF cases were resurged due to negligence of vaccination</td>
</tr>
<tr>
<td>1992</td>
<td>The last case of CSF in Japan in December at Kumamoto pref.</td>
</tr>
<tr>
<td>1996</td>
<td>Start of CSF “eradication” project (5 years)</td>
</tr>
<tr>
<td>2000</td>
<td>National ban of vaccination in October (except for farms licensed by prefectural government)</td>
</tr>
<tr>
<td>2006</td>
<td>Specific Domestic Animal Infectious Disease Quarantine Guidelines for CSF</td>
</tr>
<tr>
<td>2007</td>
<td>Complete ban of vaccination (Nation-wide)</td>
</tr>
<tr>
<td>2015</td>
<td>Report its CSF freedom to the OIE</td>
</tr>
<tr>
<td>2018</td>
<td>Outbreak in Gifu pref.</td>
</tr>
</tbody>
</table>

**History without disease outbreak**
History of CSF eradication in Japan

Inactivated vaccine (with formalin or crystal violet)  GP live vaccine (GPE- strain)

Eradication Program

Last outbreak (1992)
Disease control guideline

(Annually issued by Director of the Animal Health Division)

- Classical Swine fever

  - Prevention
    - Trade pigs 10 days after vaccination
    - Vaccination (1 ml, IM: GPE^-)
      - Fattening: 30-40 days after birth
      - Breeding: 30-40 days after birth, 1 month after the 1st vaccination boost annually

  - Control
    - Slaughter of affected animal
    - Emergency vaccination (including infected flock)
    - Movement control
    - Control will be lifted 3 weeks after the last slaughter of affected pig
# Disease control guideline

(Cont.)

Guidelines for treatment of pigs in infected farms

<table>
<thead>
<tr>
<th>Vaccinated</th>
<th>Not vaccinated</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Not affected</td>
<td>Affected</td>
</tr>
<tr>
<td>Bw 55-60 kg (fit for slaughter)</td>
<td>Quarantine (slaughter permitted after 3 wks without symptoms)</td>
</tr>
<tr>
<td>Age over 50 days (unfit for slaughter)</td>
<td>Quarantine (vaccinate)</td>
</tr>
<tr>
<td>Age under 50 days (suckling piglets)</td>
<td></td>
</tr>
</tbody>
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