FMD STATUS AND CONTROL STRATEGY IN JAPAN

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JAPAN

Symposium on Prevention and Control of Foot and Mouth Disease
(13 November 2014 Tokyo, Japan)
CONTENTS

- Recent FMD situation
- Challenges of control strategies during peace time
RECENT FMD SITUATION
## RECENT FMD OUTBREAKS IN JAPAN

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Description</th>
<th>Cause</th>
<th>Precautions</th>
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<tbody>
<tr>
<td>31 Dec 2022</td>
<td>Tokushima</td>
<td>Farm outbreak</td>
<td>Virus</td>
<td>Quarantine</td>
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<tr>
<td>28 Nov 2022</td>
<td>Okayama</td>
<td>Zoo outbreak</td>
<td>Bacteria</td>
<td>Vaccination</td>
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<td>10 Nov 2022</td>
<td>Osaka</td>
<td>散户</td>
<td>Virus</td>
<td>Isolation</td>
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<td>5 Nov 2022</td>
<td>Aichi</td>
<td>School outbreak</td>
<td>Virus</td>
<td>Social distancing</td>
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OUTLINE OF FMD OUTBREAKS IN 2010

20/April/2010
- Increase in the number of suspected infected animals waiting for culling

19/May
- Decrease in the number of suspected infected animals waiting for culling

4/June
- Vaccination started on May 22.
- Spread of the disease
- Peak number of suspected infected animals waiting for culling
- Suspected infected animals waiting for culling

27/July
- Decrease in the number of suspected infected animals waiting for culling

5/February/2011
- Spread of the disease
- Suspected infected animals waiting for culling

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Genetic analysis of FMD virus
- The viruses isolated in Japan were type O and closely related to the strains isolated in Hong Kong, Korea and Russia. The gene homology between the strains isolated in China and Japan was extremely high
- Estimates that the virus was likely to be introduced from FMD affected countries in Asia via people or goods

Very early stage of FMD epidemic
- Estimates that FMD virus spread to over 10 farms when the first case confirmed on 20 April. The delay confirmation was one of the factors for spread
- Not deny the possibility of the FMD virus introduced into Japan by movement of people

Potential risk factors in the transmission of FMD virus
- A potential factor of the spread of FMD among farms was thought to be mainly by means of movement of farm workers and livestock transport vehicles
- In the area where FMD occurred at high levels, not only affected farms but surrounding areas were thought to be contaminated with large amounts of the virus. In such area, there is the possibility that the virus was spread by using common road and mechanical vector transmission such as small animals
CHALLENGES OF CONTROL STRATEGIES DURING PEACE TIME
BASIC POLICIES

- Prevention
- Early detection and notification
- Prompt response

Act on Domestic Animal Infectious diseases Control
Guidelines on FMD Prevention and Control
Standards of Biosecurity for Farming
MEASURES FOR PREVENTION

- Strict control at points of entry by MAFF (Animal Quarantine Service)
  
The virus was likely to be introduced from FMD affected countries in Asia via people and goods
  
- Disinfection of shoes of travelers and vehicles at port
  
- Questionnaire for travelers coming into, luggage inspection, disinfection (if necessary)
  
- Quarantine detector dogs
PREVENTIVE MEASURES AT PORTS

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MEASURES FOR PREVENTION

- Strict biosecurity measures at farms

  Poor biosecurity practices at farms

  - Compliance with the Biosecurity standards (annual reporting)
  - On farm inspections at once a year in principle
  - Guidance and advice, Recommendations, Orders, Penalty
CONTENTS OF BIOSECURITY STANDARDS

1. Collecting the latest information about animal disease control
2. Setting biosecurity control areas
3. Preventing Pathogens from being brought into biosecurity control areas
4. Preventing contamination with pathogens through wild animals, etc.
5. Maintaining hygiene in the biosecurity control areas
6. Observation of animal health situation and measures to be taken when abnormalities are observed
7. Securing burial sites or preparation for incineration or rendering
8. Keeping records in order to enable prompt identification of infection routes, etc.
9. Additional measures to be taken by large-scale livestock owners
   ✓ Deploying a veterinarian responsible for coordinating with the livestock hygiene service center
   ✓ Developing internal reporting rules
BIOSECURITY MEASURES AT FARMS

Disinfection gate for vehicles at entrance to a farm

Disinfection bath at entrance to a barn

Traffic cone restricting entering farm

Signs requesting the visitors to fill out the visiting records
# IMPLEMENTATION OF THE STANDARDS OF BIOSECURITY FOR FARMING

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<table>
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<th>Compliance rate (2013)</th>
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MEASURES FOR EARLY DETECTION/REPORTING

- Early detection of infected animals and reporting

  Delay detection/confirmation was one of the factors for spread

  - Observing animals for signs of disease everyday
  - Clarification of clinical signs needed to report
  - Clarification of rules on sending samples for diagnostic test
SURVEILLANCE (PASSIVE SURVEILLANCE)

• Notification needs to be made to the relevant governor of the prefecture when one of the signs outlined in the following table is found by a farmer or veterinarian. (Since October 2011)

<table>
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<th>Typical clinical signs designated by the MAFF (Cattle, buffalo, deer, sheep, goat, pig and boar)</th>
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| 1 | □ body temperature is more than 39 °C
 □ excessive salivation, lameness, non-ambulatory, apparent reduction in milk yield, permanently dried-up milk yield
 □ vesicles (i.e. intact or ruptured, blisters and ulcers) in and around the mouth (e.g. buccal mucosa, dental pad), on the feet and the coronary band, and on the mammary gland. (For deer, □ and □) |
| 2 | There are several animals that are held within the same pen (or the barn, if one animal is held per pen) showing “vesicles” within the mouth. |
| 3 | More than half of the total calves have died within a day or two, where there are several animals that are held within the same pen or surrounding pens (or the barn, if one animal is held per pen). N.B. It is not considered as mortality under Clause 3, if animals have died due to a natural disaster such as sudden change in atmospheric temperature, fire, storm and flood, or any other cause apparently not due to FMD outbreak. |
SURVEILLANCE (PASSIVE SURVEILLANCE)

Notified cases since October 2011

<table>
<thead>
<tr>
<th>2011 (Oct.~)</th>
<th>2012</th>
<th>2013</th>
<th>2014 (~Oct)</th>
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<tr>
<td>6 cases</td>
<td>17 cases</td>
<td>15 cases</td>
<td>4 cases</td>
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Among the notified cases since October 2011...

- 6 cases - diagnosed as Parapox virus infection
  - 5 cases confirmed as Bovine Papular Stomatitis
  - 1 cases confirmed as Contagious Ecthyma

- 1 case - diagnosed as Bovine Viral Diarrhea virus Type 1 infection
FLOW CHART OF DIAGNOSTIC TEST

Report from producer

↓

On farm inspection by Prefectural Animal Health Inspectors
(clinical inspection, photographing, sampling)

↓

Send sample (superficial epithelial cells, swabs of vesicular lesions and serum) and photo from LHSC to NIAH

↓

Diagnostic Test (RT-PCR, ELISA, Virus isolation)

Livestock Hygiene Service Center (Pref. Gov’t)

National Institute of Animal Health

Specified in the Guidelines
LOCATION OF FACILITIES FOR ANIMAL HEALTH

- National Institute of Animal Health: 4
- Local Livestock Hygiene Service Centers: 170 (2014/3/31)

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FMD DIAGNOSIS

- All laboratory tests for FMD diagnosis are conducted at National Institute of Animal Health (NIAH) located in Kodaira-city, Tokyo.
- RT-PCR positive animals and animals kept in the same farm are destroyed as FMD cases.

**To identify the disease agent**
RT-PCR targeted at the 3D region and VP1 gene ( Virus isolation)

**To identify the serotype**
Antigen detection ELISA (Indirect sandwich ELISA)

**To detect the presence of antibodies against FMD**
Liquid-phase blocking ELISA ( Virus neutralisation test)

In case that many FMD cases have already been confirmed in a Movement Restriction zone, animals showing typical clinical signs in the same zone are recognized and destroyed as FMD cases based on photographs of the abnormal lesions.
MEASURES FOR CONTAINMENT

- Measures to prevent the spread
  - Reviewing the guidelines based on new knowledge and preparedness for emergency response in accordance with the guidelines
    - Reviewing the guidelines at least once every three years
    - Preparedness for emergency response
      - Secure the necessary human resources and materials for emergency response
      - Simulation exercise
      - Improvement of tools for FMD control
        - Stocks of appropriate FMD vaccine
    - Further financial support
Secure human resources

- Prefectural governments agree to a contract of dispatch of personnel with private sectors such as agricultural producers group, construction company group, security company group
- MAFF makes a list of emergency support team member who can support emergency response by prefectural governments.

Secure materials

- Prefectural governments secure the necessary materials such as protective clothing for initial response and agree to a contract of a priority supply of such materials in the event of an outbreak
- MAFF secures a certain amount of the materials and leases them to Prefectural governments in the event of an outbreak.
FMD SIMULATION EXERCISES

Desk-top simulation exercises for all prefectural governments, organized by MAFF. After the exercises, publication of the results.

Method in 2014 (period: 12-26 February 2014)

- Exercise 1: Prefectural veterinary officers of each prefecture visit the farm for inspection on the assumption that a cattle farm notified them of suspicious FMD cases; take pictures of the site where the lesions most commonly occur; conduct epidemiological investigations on the farm.

- Exercise 2: Each prefectural government makes basic documents necessary for initial control response on the assumption that three outbreaks are confirmed at the same day.
RESULTS AND EVALUATION

Sending photos
- Photo image clearness and photographing site of the lesions improved steadily
- But sending photos from an office (not from a field site) observed. Need to further utilize mobile data communication

Disinfection points
- Need for coordination among concerned parties (prefectural and municipal governments, road administrators) to secure an ideal disinfection point

Secure materials
- Need to concretely figure out the suppliers and quantity of materials
FMD SIMULATION EXERCISES

In addition to the desk-top simulation exercises, many prefectures conduct demonstration-type exercises.
“Map System for Controlling Animal Diseases” was developed in October 2012 and has been available by all prefectural governments. Since December 2014, an enhanced system will be available.

Farms, livestock-related facilities etc. are shown in the Map.

Movement/Shipment Restriction Zone can be established in the Map and the numbers of farms and reared animals in the Zone can be displayed.

For each farm, information such as address, name of farm and farm owner, species and numbers of reared animals are available.
FMD VACCINE STOCK FOR EMERGENCY USE

- Meeting of experts annually reviews emergency FMD vaccine stocks.
- Stored vaccine and concentrated antigen are tested by National Veterinary Assay Laboratory.

<table>
<thead>
<tr>
<th></th>
<th>Vaccine</th>
<th>Concentrated antigen</th>
<th>Total</th>
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<tr>
<td>O</td>
<td>400,000</td>
<td>600,000</td>
<td>1,000,000</td>
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<tr>
<td>Asia1</td>
<td>200,000</td>
<td>200,000</td>
<td>400,000</td>
</tr>
<tr>
<td>A</td>
<td>300,000</td>
<td>200,000</td>
<td>500,000</td>
</tr>
<tr>
<td>Total</td>
<td>900,000</td>
<td>1,000,000</td>
<td>1,900,000</td>
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</table>

- From 2015, trivalent vaccine and trivalent concentrated antigen (O1, Asia1, A) will be stored.
MEASURES FOR CONTAINMENT

- Financial support by MAFF

Enough financial support is essential to act rapidly and effectively to control FMD. Reduced compensation rate for farmers who failed to take necessary preventive measures

- →100% Compensation for infected animals and preventive culling
- Covering costs for incineration and burial of livestock corpses and contaminated goods
- Compensation for sales reduction caused by movement restriction
- Reduced compensation rate (including no compensation) for farmers who failed to take necessary preventive measures
FUTURE CHALLENGES FOR FMD CONTROL
FUTURE CHALLENGES

- Difficulties in identifying the source and route of FMD outbreaks
  Not identify the source and route of the previous FMD outbreaks in Japan
  Wild migratory birds were possible route of introduction of Avian Influenza
  Also not identify the source and route of the Porcine epidemic diarrhea outbreaks in Japan

  ➢ Record keeping on farms: movement of visitors, vehicles, livestock
  ➢ Limit the unnecessary movement of people, vehicles, goods on to farms
  ➢ Sharing information about pathogens related to overseas disease outbreaks

- Maintaining and increasing awareness of animal health
  Gradually decreasing awareness of animal health as time passes
  ➢ Monitoring compliance with the biosecurity standards and guidance, advice, etc.
  ➢ Providing information about overseas disease outbreaks
Further strengthening control measures
Diagnostic test by National Institute of Animal Health is required in order to start initial response
- Developing and utilizing rapid diagnostic test
- Quality control by Local Livestock Hygiene Service Centers

Ensuring smooth emergency response
Insufficient system for securing human resources and materials
- Insufficient points (e.g. human resources: veterinarian, workers, materials: disinfectant, etc.) are checked by the simulation exercise
- Secure materials by means of a contract with concerned parties

Selection of FMD vaccine strains
Insufficient information sharing regarding FMD outbreaks and vaccine strain among countries concerned
- Selection of FMD vaccine strains based on timely and accurate information on epidemic strain
~ Thank you for your attention ~