



World Organisation  
for Animal Health  
Founded as OIE

# Country Presentation FMD – Prevention and Preparedness

## JAPAN

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Deputy group leader

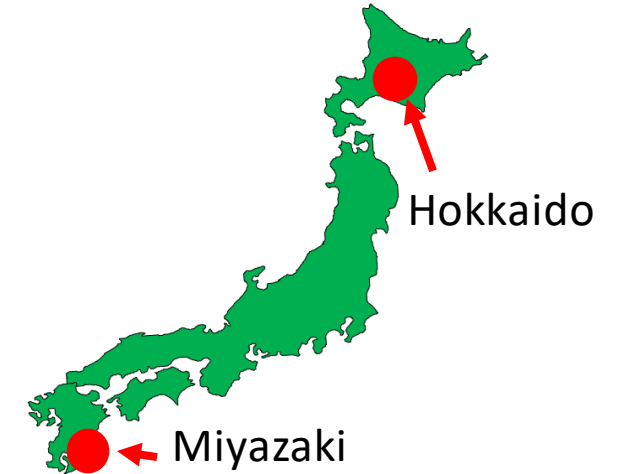
Exotic disease research group

NARO National Institute of Animal Health

# FMD outbreaks in Japan

- Recent outbreaks in 2000 and 2010

Year	Affected area	Affected species	Culled animals	Causative strain
2000	Miyazaki Hokkaido	Cattle	740	0/JPN/2000 ME-SA PanAsia
2010	Miyazaki	Cattle Pigs	297,808	0/JPN/2010 SEA Mya-98



- Japan is free from FMD without vaccination since 2011

# FMD Prevention activities

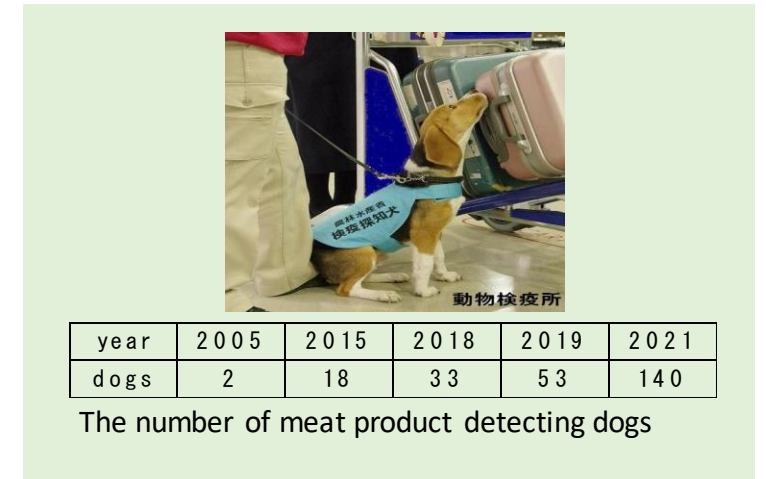
## Border control and Quarantine measure

### (1) Border inspection and quarantine operations for live animals / meat / animal products

- Health certificate issued by competent authorities of exporting countries are needed.
- Import of relevant commodities from FMD infected countries/zones is prohibited.
- Live animals are quarantined for 15 days in animal quarantine premises after arrival.

### (2) Enhanced border inspection for passengers/travelers

- Results of monitoring of accompanied meat products  
ASFVs were isolated from 4 meat product.  
ASFV genome were detected from 104 cases ( ~ Mar. 2022)
- Detector dogs were put in place at international airports/seaports/post offices



# FMD Preparedness strategies

## Regulations and Laws

Guideline of compliance rules for animal husbandry :

disinfection, observation, early notification, suspension of shipment (penalty \$2,000 or less)

Act on Domestic Animal Infectious Diseases Control :

for preventing the outbreak and spread of livestock infectious diseases

(penalty \$20,000 or less (\$50,000 or less for corporations) or imprisonment of 3 years or less )

### Specific Domestic Animal Infectious Disease Quarantine Guidelines for FMD

FMD basic measure

1. Early warning system

(immediate reporting from farmer or clinical vets  
to prefectural government)

2. On-site farm inspection by prefectural vets

(clinical examination / pen-side antigen detection kit)

3. Definitive diagnosis

(by National Institute of Animal Health (NIAH))

Periodic training

- Lecture for local clinical vets
- Lecture & Training for prefectural vets

# FMD Preparedness strategies

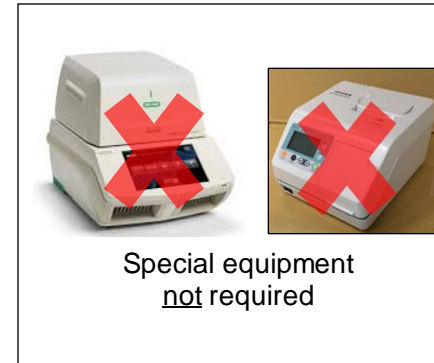
Development highly sensitive on-site antigen detection kit

In case of suspected FMD

Users are limited  
: Local veterinarian

Beware of false negative

Sample  
collection &  
preparation



Sample  
apply

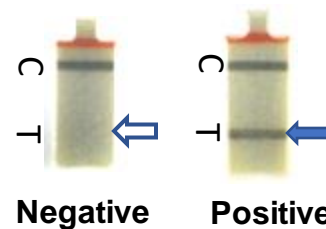


Remained sample can be used for laboratory diagnosis.  
(genome detection, sequencing and virus isolation)

Operating  
SAI device



Obtain results **apply**

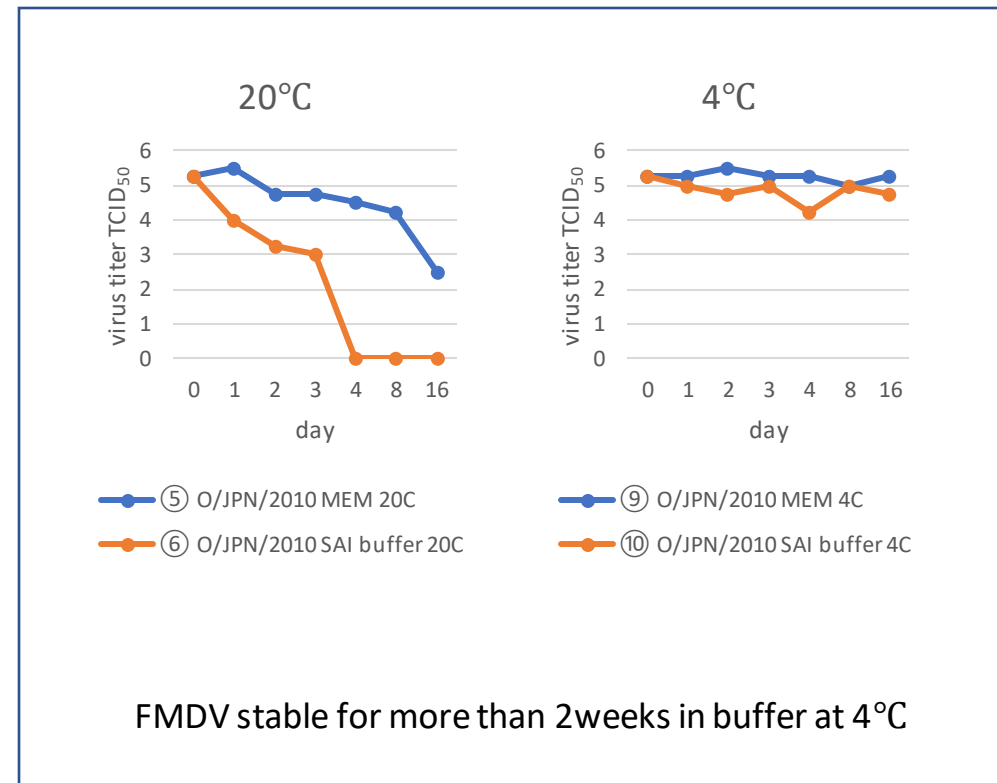
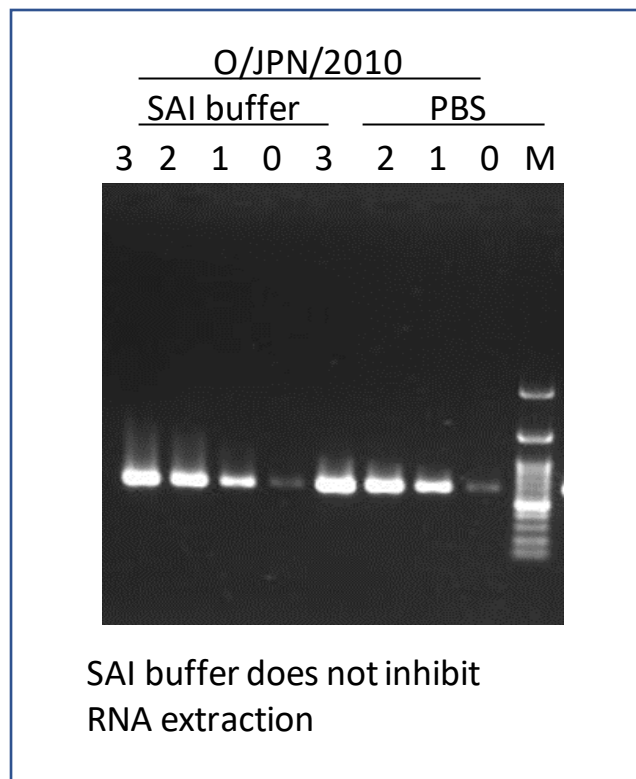


# FMD Preparedness strategies

## Vesicular epithelium emulsion prepared by immunochromatography buffer

Useful for RNA extraction, genome detection & sequencing.

FMDV is stable for 3days at 20°C, and more than 2weeks at 4°C

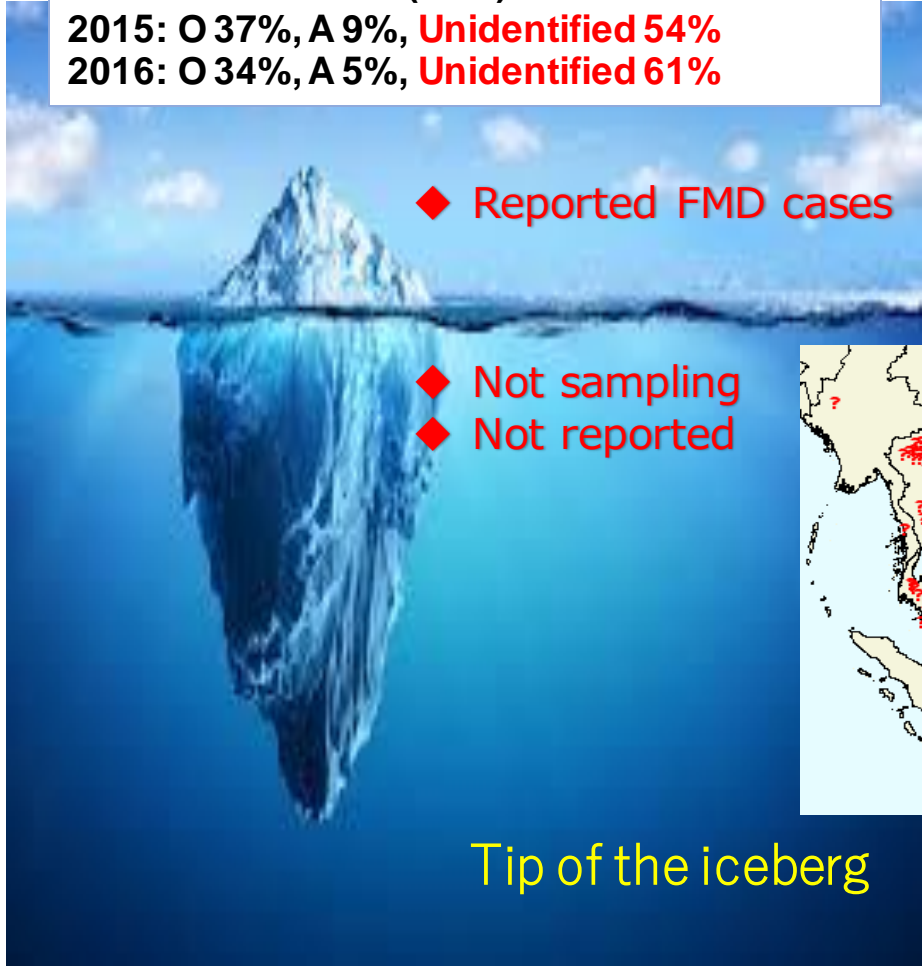


Stable for 4°C and useful for laboratory definitive diagnosis

# Contribution of pen-side kit

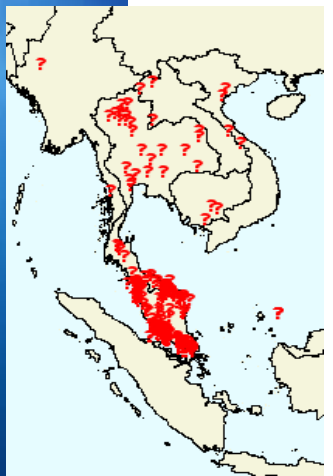
Concise report is important to control FMD in Asia

In South-East Asia (SEA) and East Asia  
2015: O 37%, A 9%, **Unidentified 54%**  
2016: O 34%, A 5%, **Unidentified 61%**



◆ Reported FMD cases

◆ Not sampling  
◆ Not reported



Tip of the iceberg



✓ Different style of breeding



✓ vast

✓ Limited numbers of vets!



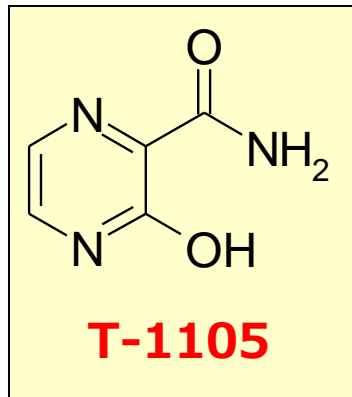
✓ Infrastructure problem (outage, traffic )  
✓ Maintenance of apparatus

# FMD Preparedness strategies



## Antiviral agent T-1105

2-pyrazinecarboxamide derivatives

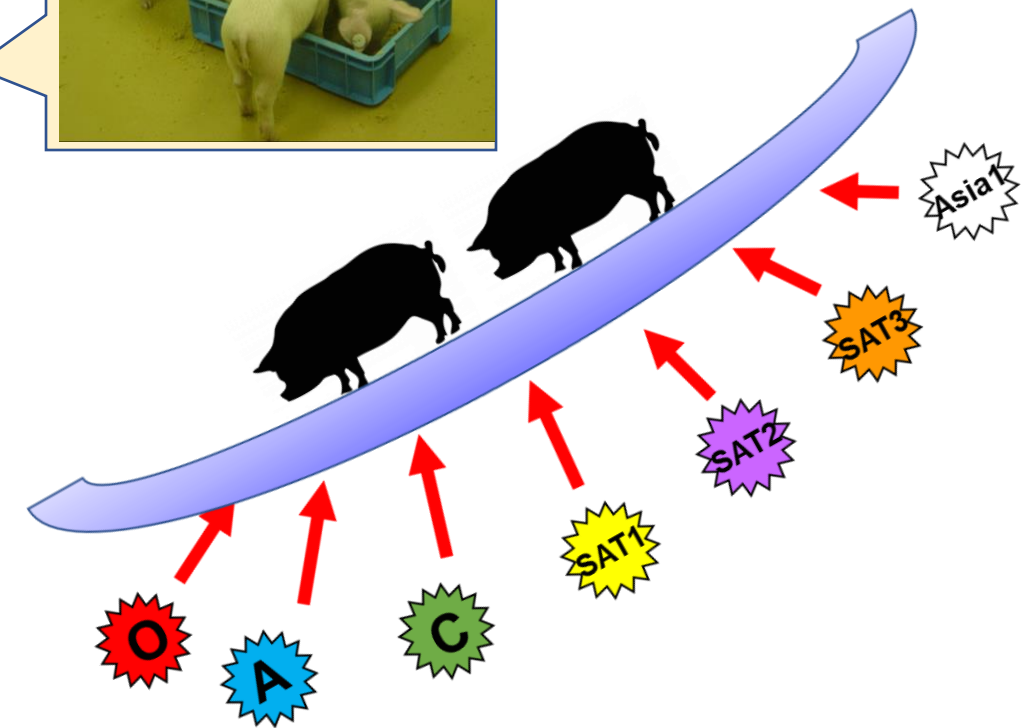


- Developed by Japanese private company
- Inhibit RNA dependent RNA polymerase
- unaffected by antigenicity diversities
- It can be applied by intraoral administration mixed with feed



\*Antiviral agent for 10,000 pigs is stock at the animal quarantine station.

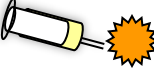
\*When FMD outbreak happened on a large pig farm, the administration of the material will be discussed.





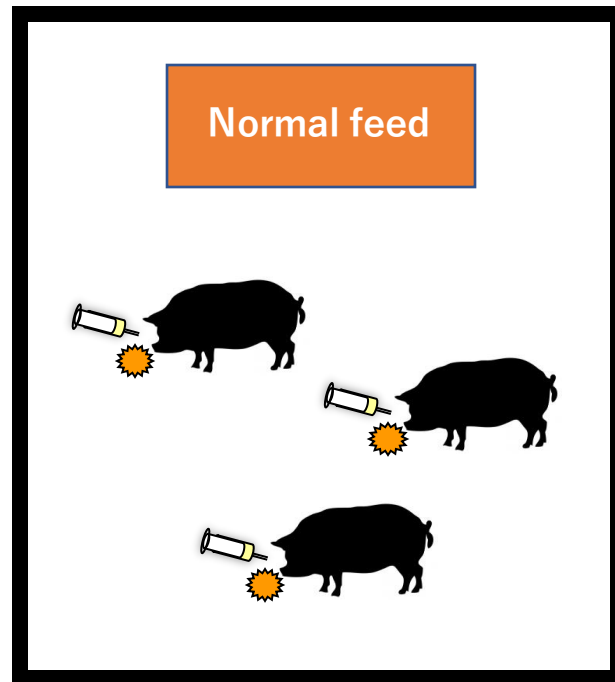
# FMD Preparedness strategies

## Experimental infection to evaluate antiviral effect in pig

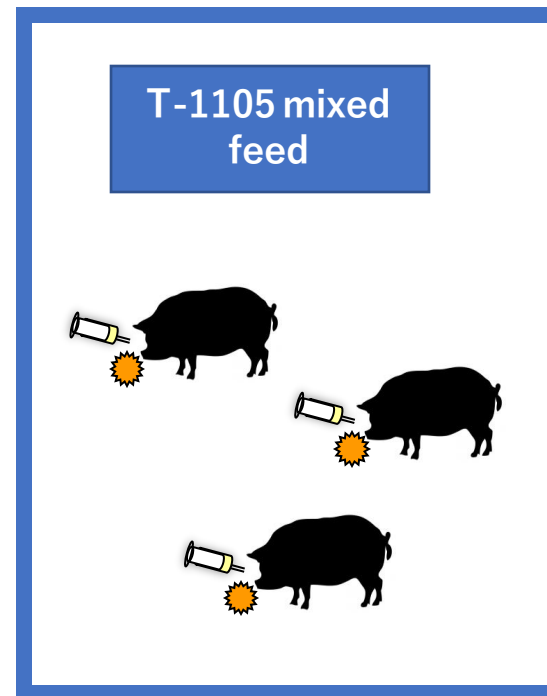
 **Virus inoculation**  
( $10^{5.5}$  TCID<sub>50</sub> of O/HKN/2015)

Porcinophilic strain  
Antigenically distinct from all vaccine strain

### Control group



### T-1105 administration group

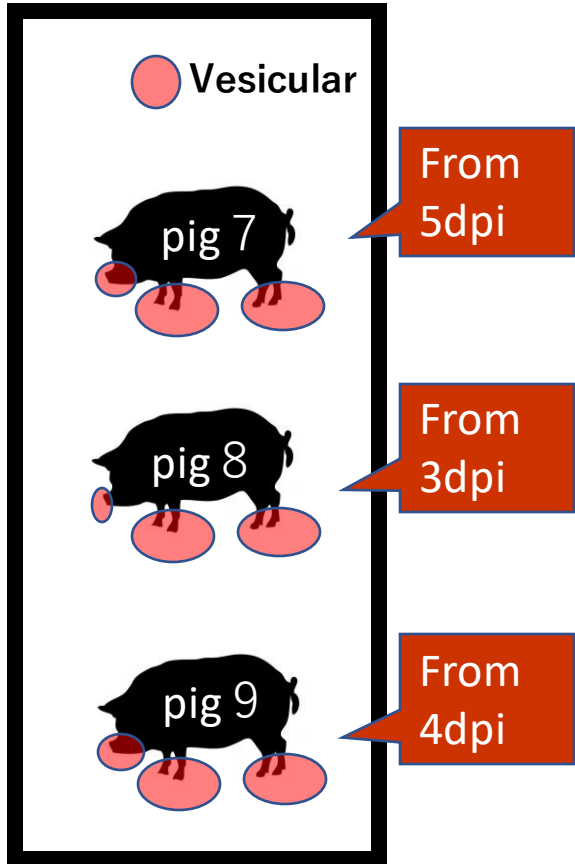


\* T-1105 200 mg/kg \*2/day  
\* From 1 hour before virus inoculation to 6 dpi.

# FMD Preparedness strategies

## Clinical signs

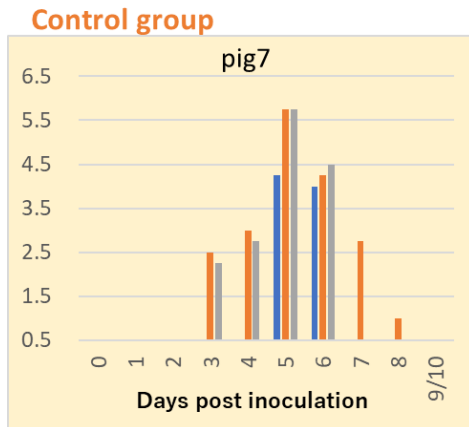
### Control group



Snout



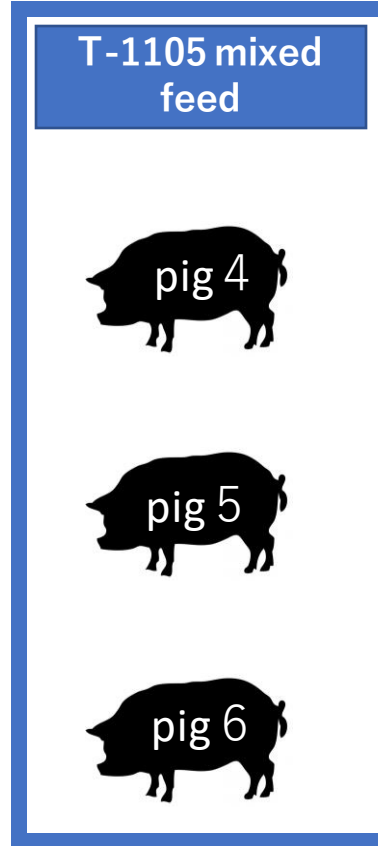
Hindlimb



Virus excretion

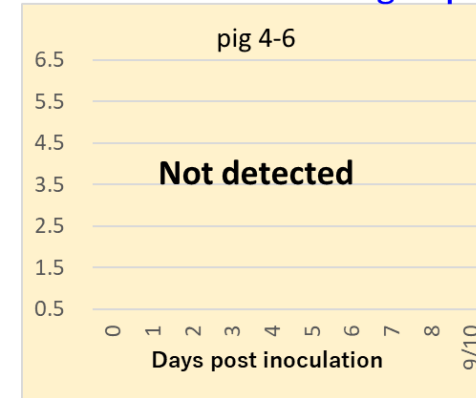
## Clinical signs

### T-1105 administered group



Hindlimb (9 dpi)

### T-1105 administered group

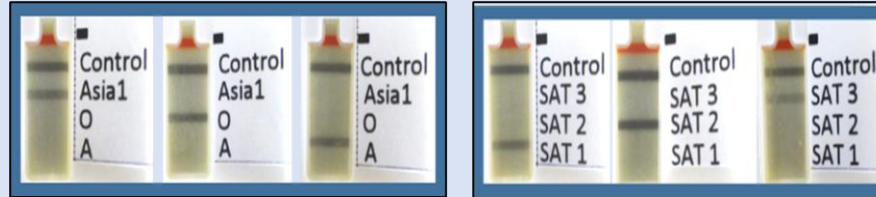


Virus excretion

- ★ T-1105 administered pigs showed no clinical sign
- ★ T-1105 suppressed viremia and virus excretion

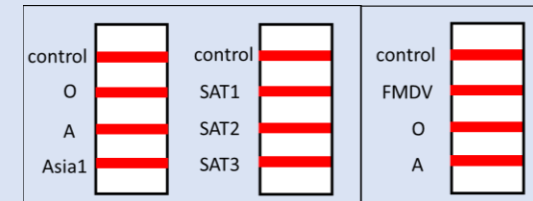
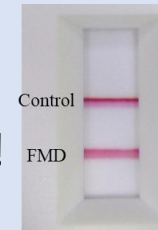
# Future research and challenges

- ✓ Serotyping kits for each pool



- ✓ Also developed colloidal gold based immunochromatography kit

More rapid, easy and inexpensive!



On site rapid and precise FMD detection and serotyping will facilitate more sampling and sample submitting

Hope that T1105 could be an effective FMD-controlling tool together with vaccine.

- ✓ Vaccine to live and Antiviral agent to live are ideal, but T1105 should have gone through the pharmaceutical procedure.
- ✓ Unfortunately, T1105 can not be applied to cattle.



Therefore

→ Searching new antiviral agent from plant extracts and natural compounds that are safe and effective in all animal species.



Thank You for your attention!