

**WOAH workshop 23–25 March 2026 Paris**

# **Strengthening Preparedness and Response to Biological Threats in Europe**

## **Vaccine banks**

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Boehringer Ingelheim for Health for Animals



**1.Study case of antigen bank for FMD vaccine:**

**2.Points to consider**

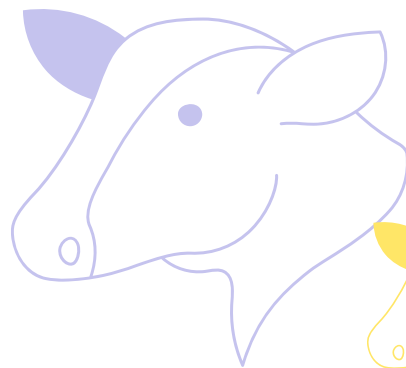


**FMD is a permanent threat**

**Outbreak is possible**

**at any time**

**and anywhere**



**~1.782 bn**

global population



**~1 bn**

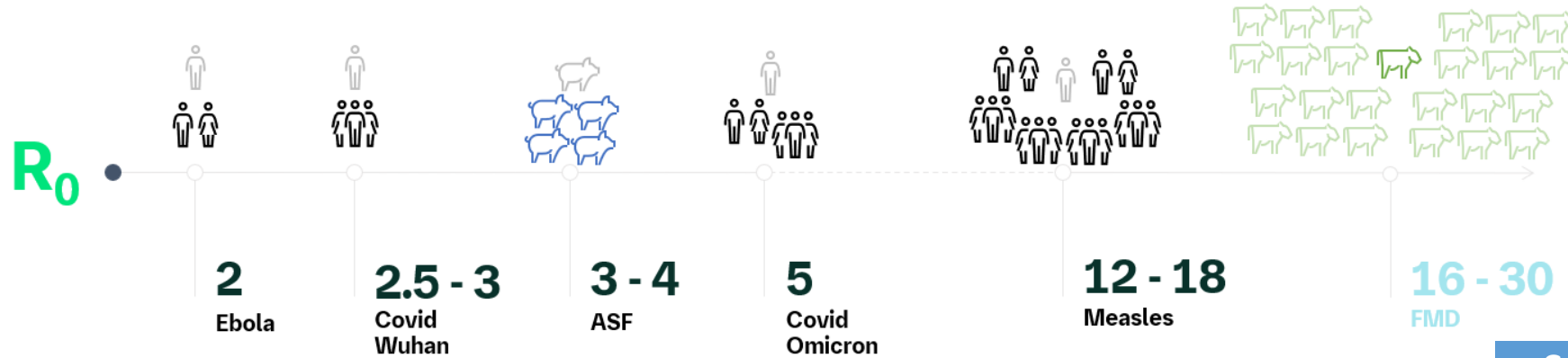
in FMD endemic countries (56%)



**13% are vaccinated**

# FMD is the most infectious viral disease , multi-serotypes (7), multispecies leading to major Social impacts

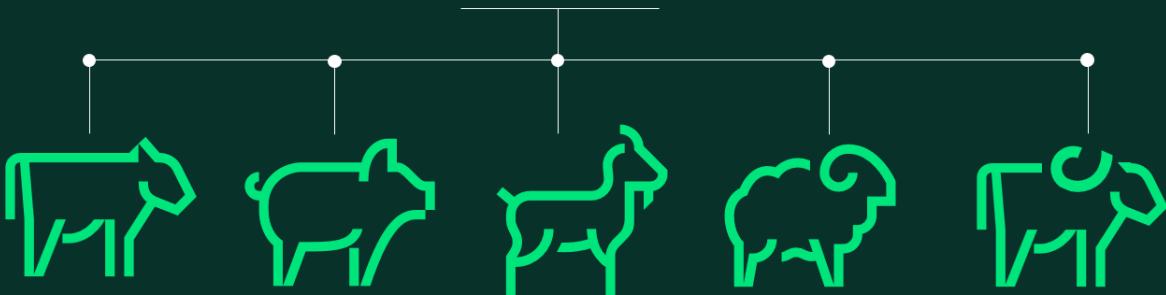
Basic Reproduction Number ( $R_0$ ) : the number of individuals that 1 sick individual/animal will infect on average, in a naive population



Sources: [journals.plos.org/plosone/article?id=10.1371/journal.pone.0242128](https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0242128)

Pittman Ratterree, D.C.; Chittapilly Dass, S.; Ndeffo-Mbah, M.L. The Reproduction Number of Swine Viral Respiratory Diseases: A Systematic Review. Vet. Sci. 2024, 11, 300. [https://doi.org/10.3390/vetsci11070300apps.who.int/iris/bitstream/handle/10665/242335/WER9013\\_121-123.PDF?sequence=1](https://doi.org/10.3390/vetsci11070300apps.who.int/iris/bitstream/handle/10665/242335/WER9013_121-123.PDF?sequence=1)

Affects domestic & wild cloven-hooved animals



## Social impact of Outbreaks

### Personal impacts

- Mental health
- Physical health and wellbeing

### Household impacts

- Social impacts of reduced income
- Greater demands on family members

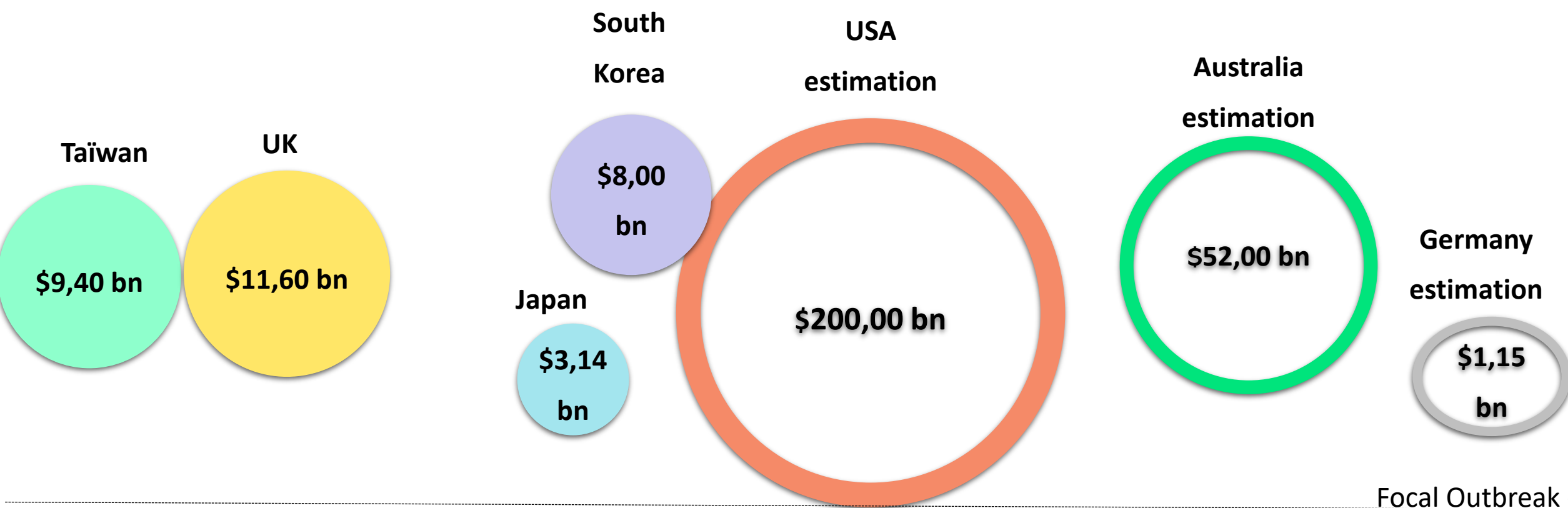
### Community and regional impacts

- Community cohesion
- Community services
- Impacts on other industries

### In-migration and out-migration

Microsoft Word - Potential Socioeconomic Impacts FMD Final\_101013.docx

# Economic Impact of FMD Outbreaks - total cost in bn US\$



Focal Outbreak -  
only 14 buffaloes

Taiwan: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3989032/>  
UK: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3989032/>  
USA : ECONOMIC IMPACT OF ALTERNATIVE FMD EMERGENCY VACCINATION STRATEGIES IN THE MIDWESTERN UNITED STATES | Journal of Agricultural and Applied Economics | Cambridge Core  
Australia : [www.agriculture.gov.au/abares/research-topics/biosecurity/biosecurity-economics/fmd-update-of-2013-estimate#:~:text=In%202013%2C%20ABARES%20estimated%20the,by%20the%20time%20of%20detection.](http://www.agriculture.gov.au/abares/research-topics/biosecurity/biosecurity-economics/fmd-update-of-2013-estimate#:~:text=In%202013%2C%20ABARES%20estimated%20the,by%20the%20time%20of%20detection.)  
Germany: Farmers group fears billion-euro loss from German foot-and-mouth disease | Reuters

## Huge impact on Trade

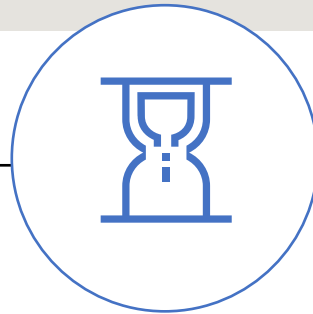
# Manufacturing Challenges

Requires Highly trained staff and highly specific equipment under EU GMP to manufacture regularly in peace time and agile enough to be ready for emergency (bank activation)



**Few global manufacturers**

Investment in high containment BSL3+ manufacturing facility, complex & costly studies for R&D, registration



**6 to 9 months standard lead-time**

**Several factors**

Antigen availability according to specific strain(s), Volumes requested, Production, Controls.

Lean mode - Financial Costs of stocks



**Planning complexity**

**GLOBAL SHORTAGE OF FMD VACCINES**

**Immediate supply of significant quantities of high-quality FMD vaccines is not available on the global marketplace**



FMD antigen banks are THE insurance to shorten and secure FMD vaccine access.

# FMD BANK – the Journey

Preparedness in Peace time : **BANK establishment and Storage**

**Bank Activation**



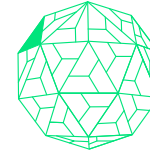
Contract  
establishment



Manufacture,  
inactivate,  
concentrate,  
test & release  
each **active  
ingredient**



QC LAB  
Quarantine  
and storage



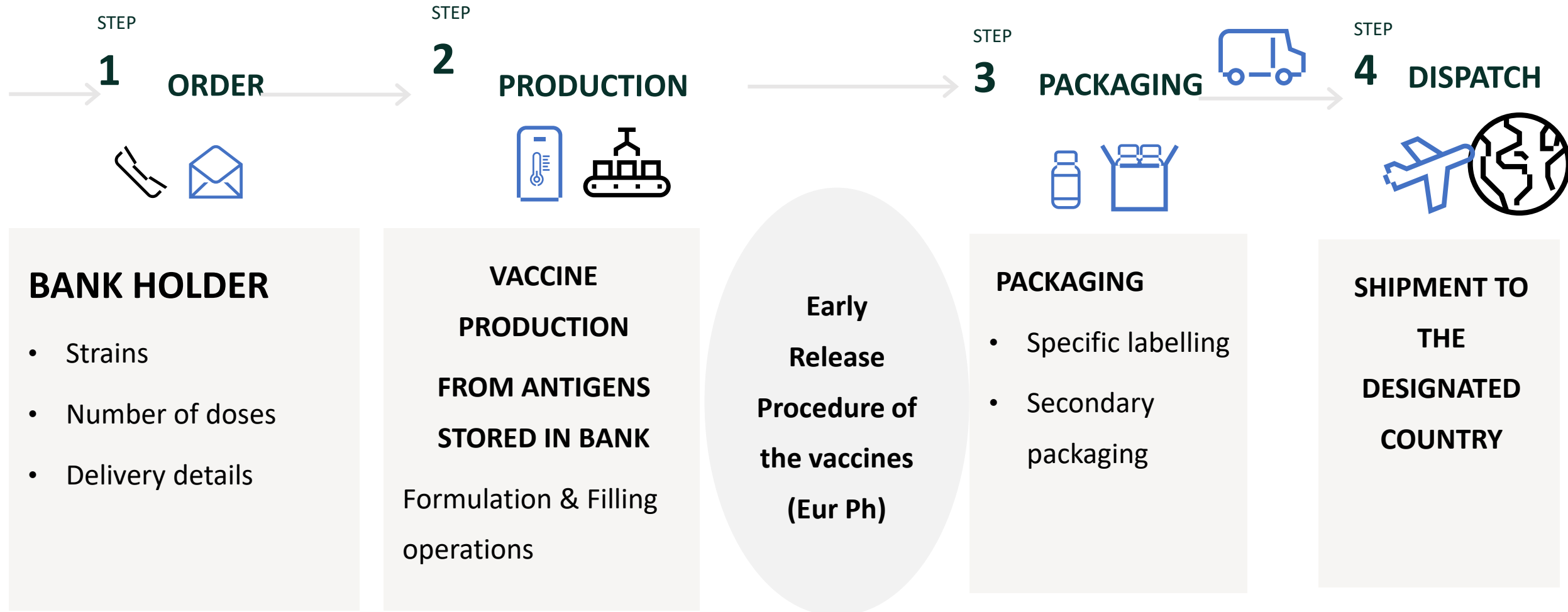
Formulate and fill  
**final vaccine**

**Approx. 6 months**

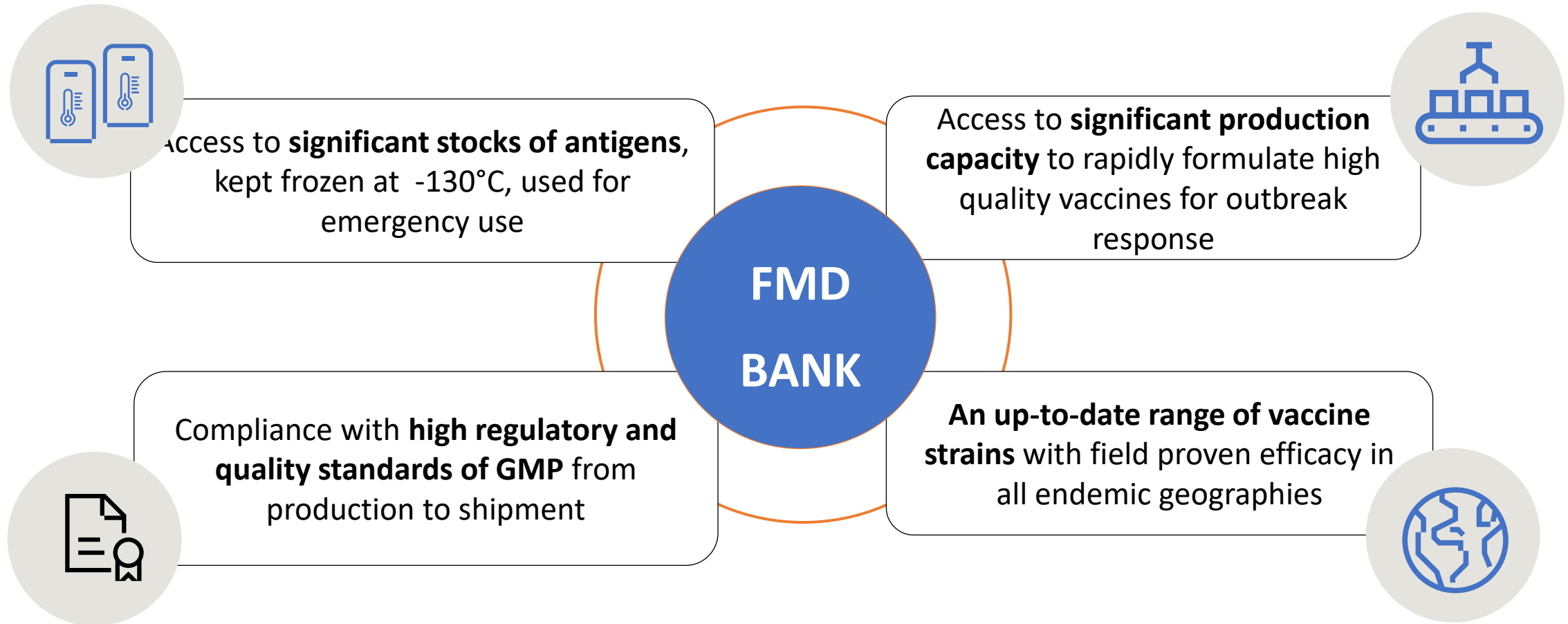
**Approx. a week**

# Assurance to get vaccine available in approx. a week

## Focus on Bank Activation step



# A comprehensive FMD Antigen Bank Contract



# ... sized and flexible to answer to the need

**Definition of contract  
duration**



**Selection of strains and  
quantities**



**Antigen property**

Ownership or  
Leasing



**Definition of Bank  
activation terms**

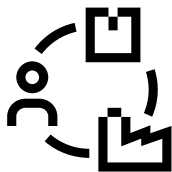
Outbreak situation  
Planned supply



Others Bank services may be provided by the manufacturer ie. **technical supports, laboratory services, simulation exercise ..**

**Definition of  
replenishment**

Conditions after  
antigens  
consumption



**Definition of Bank  
termination terms**

Storage

Formulation

Disposal

Shipment



**The bank owner owns the selected  
antigens, decide what, when to  
activate the bank and if to  
communicate  
The manufacturer execute the plan**

# BANKS A perfect example of preparedness in peace time to get access to highly specialized skills for Establishment and storage



STEP

**1**

Contract establishment



STEP

**2**

Optimal strain selection and bank sizing based on epidemiology risk assessment and outbreak modelling



STEP

**3**

Production, testing and release of Vaccine Antigen Concentrates (VAC)



STEP

**4**

Storage at ultra low temperature in highly secured and dedicated area



STEP

**5**

Raw materials security stock for each bank



STEP

**6**

Regular stability and quality monitoring for antigen security

# Conclusion: FMD study case for Antigen Banks

1 

FMD multi-serotype disease **dreadful impact**  
**a permanent threat**

2 

**Immediate supply** of high-quality vaccines is **not available** on the global marketplace , **antigen is stable for years**

3 

FMD **antigen** banks are **THE insurance to shorten and secure FMD vaccine access** with a high cost/benefits balance

4 

**AH Professionals deserve to get vaccines as one tool**

**TRUSTED partner** with proven expertise and solution

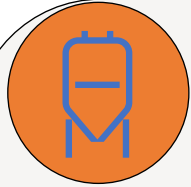
5 

FMD Bank model is in place in the EU since the 90's , adapted EU rules and EurPh,  
**replicable** to other transboundary and emerging diseases (ie BTV)

## Points to consider



# ANTIGEN VS VACCINE BANK ?



## Antigen bank

Long shelf life >5y

Flexibility to define composition

Flexibility to formulate dose, volume, adjuvant

Avoid vaccine wastage

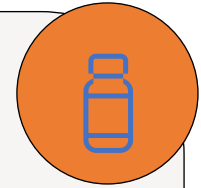
Available within a week

FMD, BTV known serotypes

- 
- 
- 
- 



## Vaccine



Shorten shelf life (12 to 24 months)

Fixed composition

Fixed dose, volume, adjuvant

Vaccine wastage

Stock immediately available

Vaccine long shelf life no virus change like RABIES vaccine



# Limits of a bank model

- **Other diseases : when Vaccine does not exist or it is too late for bank establishment**
  - Newly emerging strains, New serotype with development needed existing platform (for year 1&2) : ie BTV5, BTV3)
  - HPAI situation 2022- emergency : FR public tender 2 years vaccine supply for ducks
- **TRAINED PEOPLE IS KEY** : Outbreak simulation exercises and Lesson learned post activated bank .
- **SIZE the bank (= size the Insurance) :**

## Realistic balance based on estimation- regular update needed

- Vaccination strategy (to kill/ To keep with Re-vaccination, target Species)
- Risk assessment
- Economical (investment versus risk of loss, trade impact )
- Societal impact

# For your reading...

03 septembre 2025 Publication

## De la pertinence de développer les banques d'antigènes en santé animale en anticipation des émergences sanitaires

[santé animale](#) [CGAAER](#) [Dossiers maladies animales](#) [élevage](#) [vétérinaire](#) [santé publique](#)

Dominique CHABANET

Pascale PARISOT

avec l'appui de Loïc EVAIN

**Sept 2025 report 2077-On the relevance of developing antigen banks in animal health in anticipation of health emergencies**

[De la pertinence de développer les banques d'antigènes en santé animale en anticipation des émergences sanitaires](#) | [Ministère de l'Agriculture, de l'Agro-alimentaire et de la Souveraineté alimentaire](#)



**Thanks for your attention  
and  
dedication to Animals Health**

