

# **Recognition of FMD-free zones in China and promoting secure trade with Southeast Asian countries**



# Outline

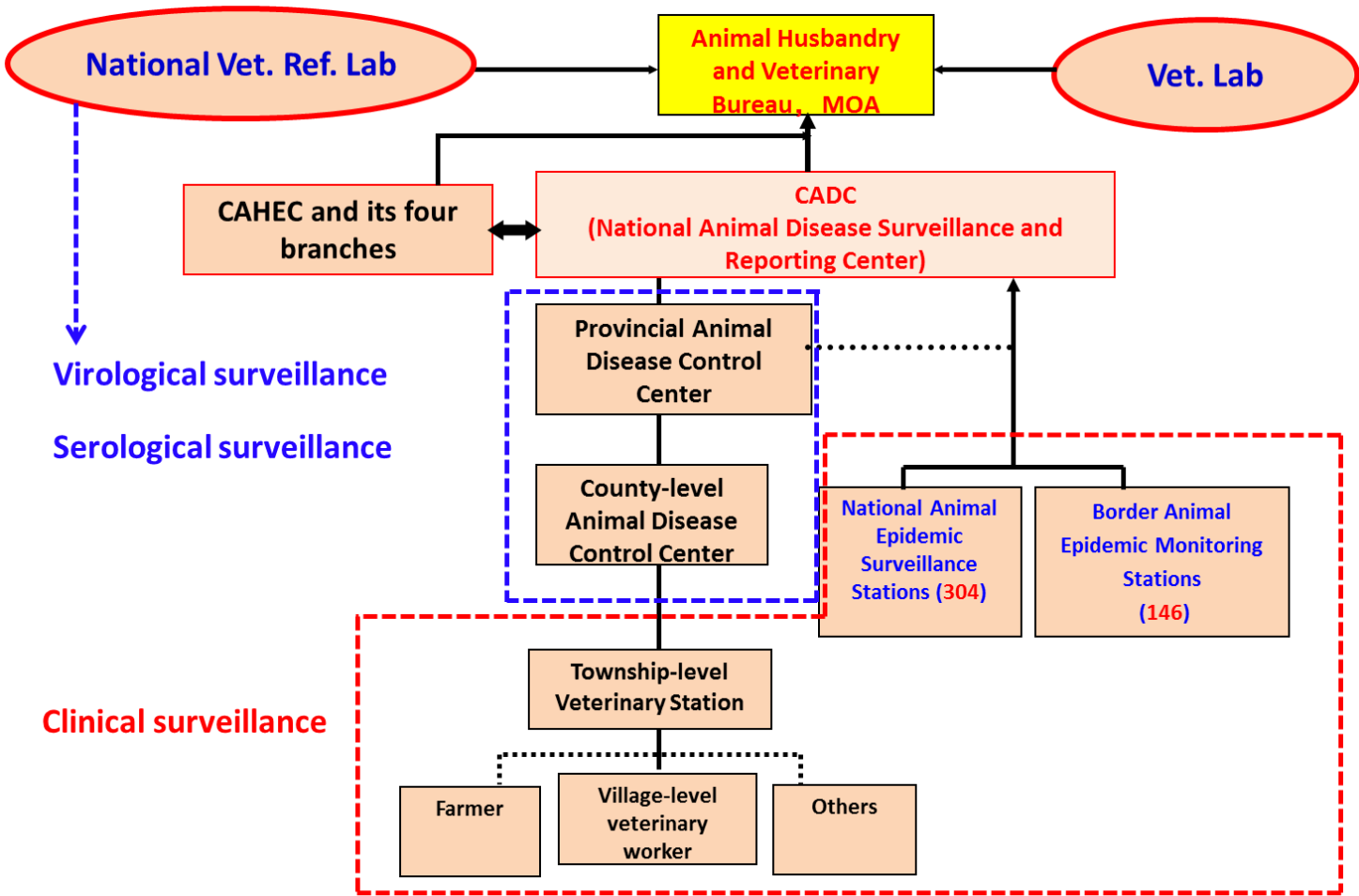
- **Construction of FMD-free zones with vaccination in China**
- **Application of FMD disease vaccine in China**
- **China's contribution to SEACFMD**
- **CAVET introduction**



# **Section 1: Construction of FMD-free zones with vaccination in China**



# 1. China Animal Disease Prevention and Control System



- in China ,
- ✓ country- province-city- county Surveillance System
  - ✓ 152 border terminal+485 report system
  - ✓ Monitoring System cloud platform

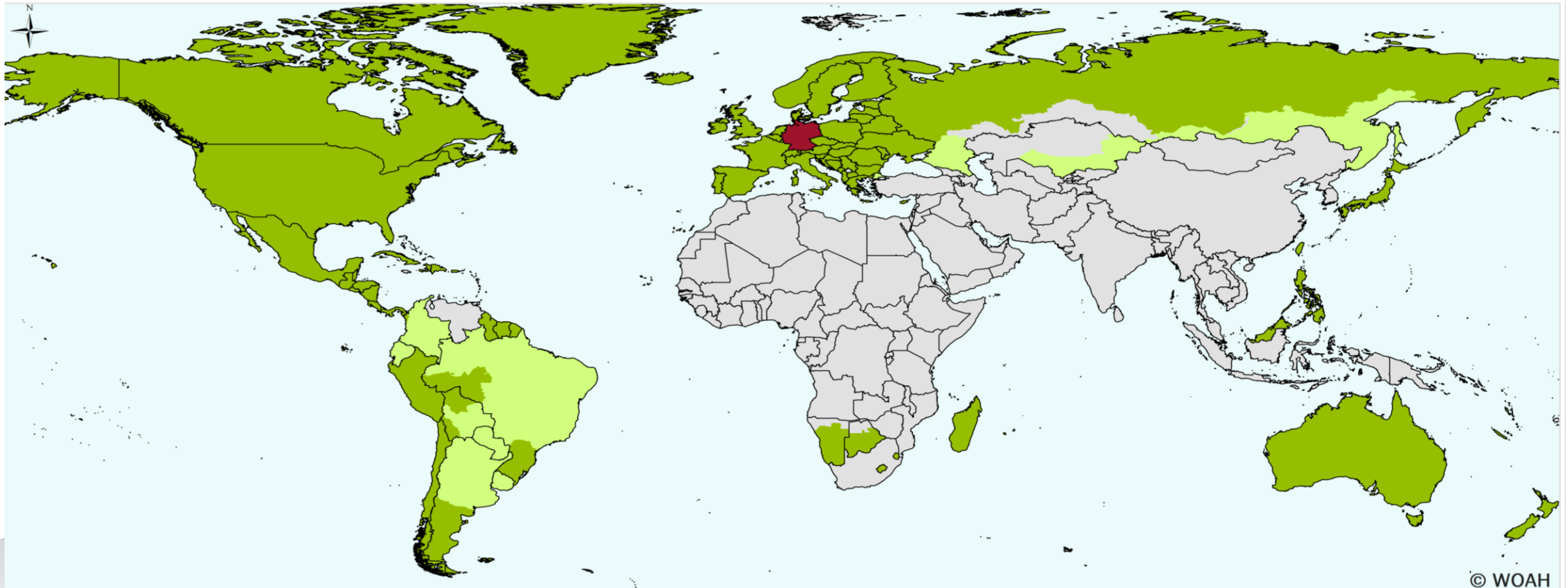
China Animal Disease Surveillance and Reporting System





## 2. World Epidemiological Situation of FMD



### WOAH Members' official FMD status map

Last update February 2025



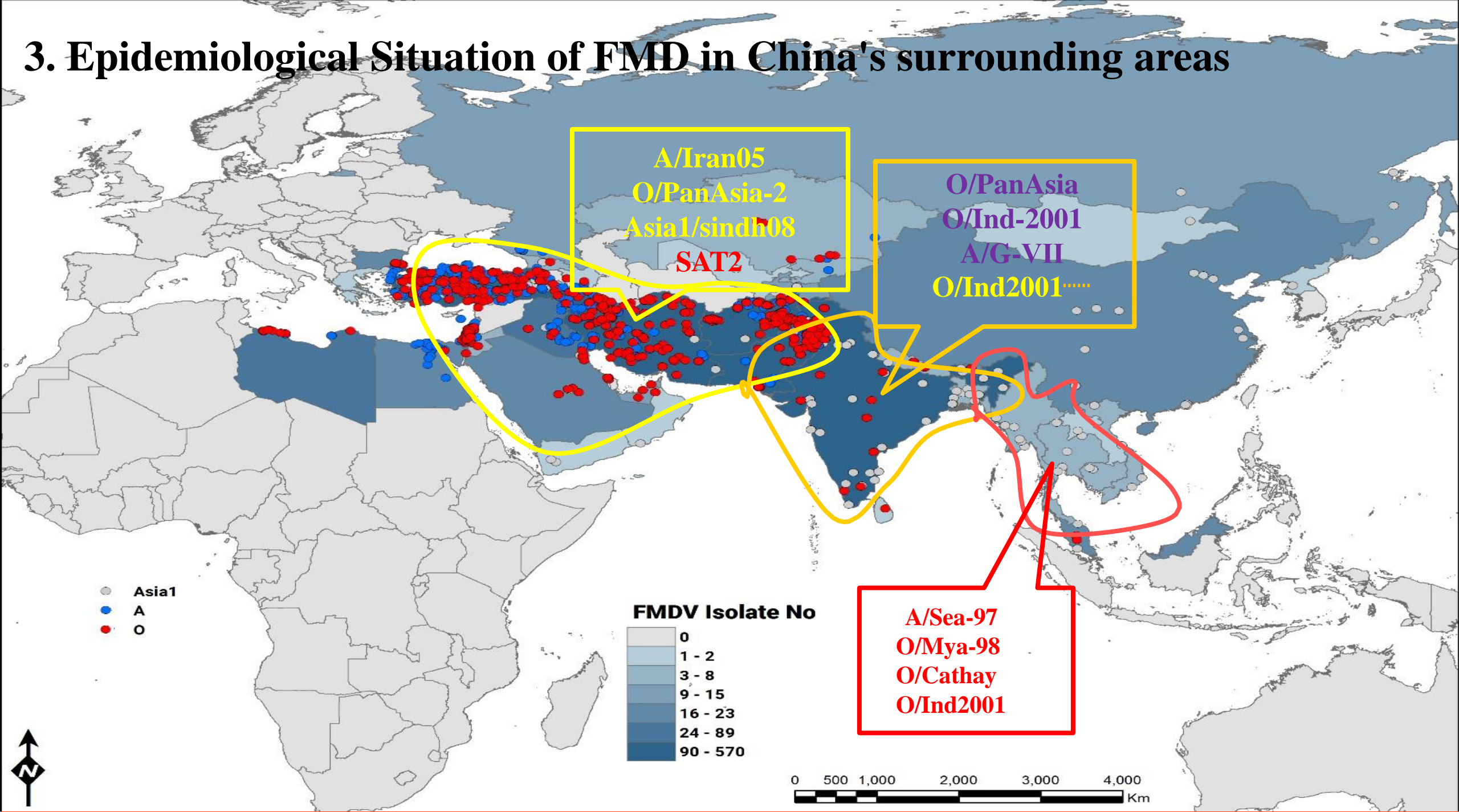
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-  Members and zones recognised as free from FMD without vaccination
-  Members and zones recognised as free from FMD with vaccination

-  Suspension of FMD free status
-  Countries and zones without an official status for FMD



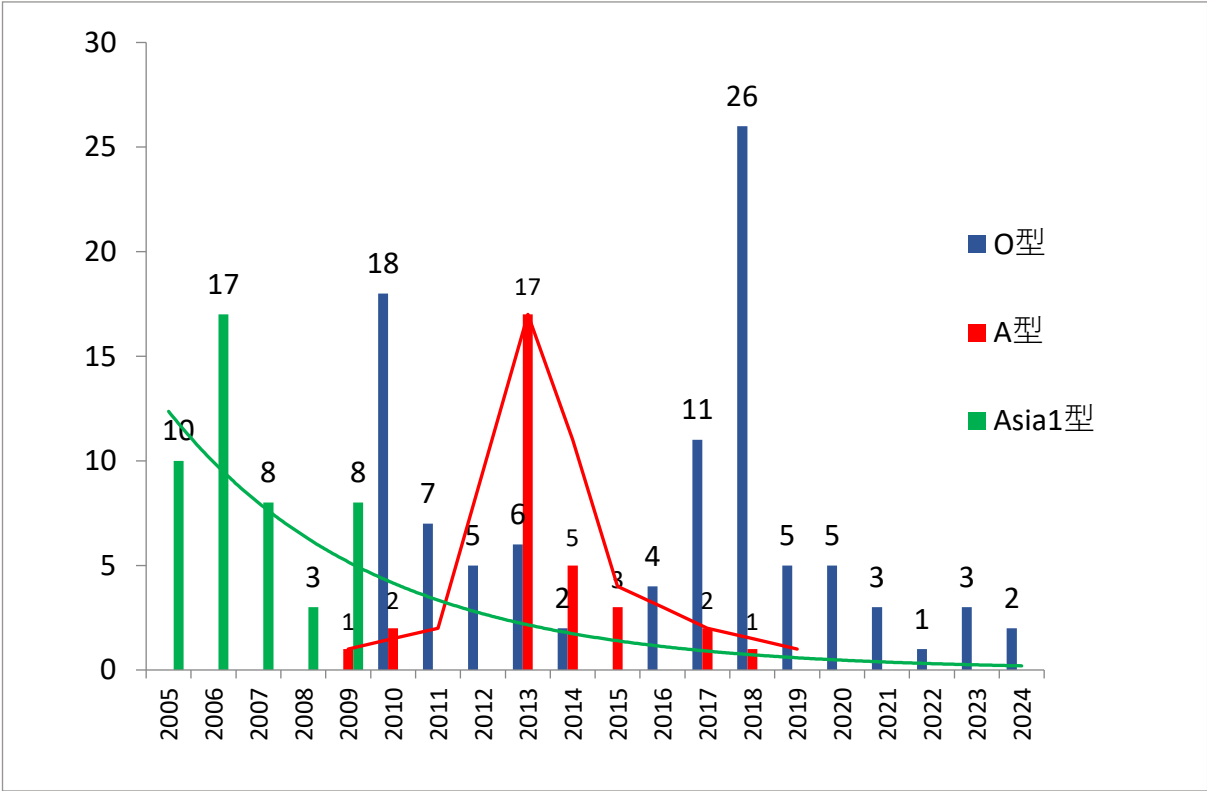
### 3. Epidemiological Situation of FMD in China's surrounding areas





# 4. Epidemiological Situation of FMD in china

Map of foot-and-mouth disease outbreaks in China from 2005 to 2024

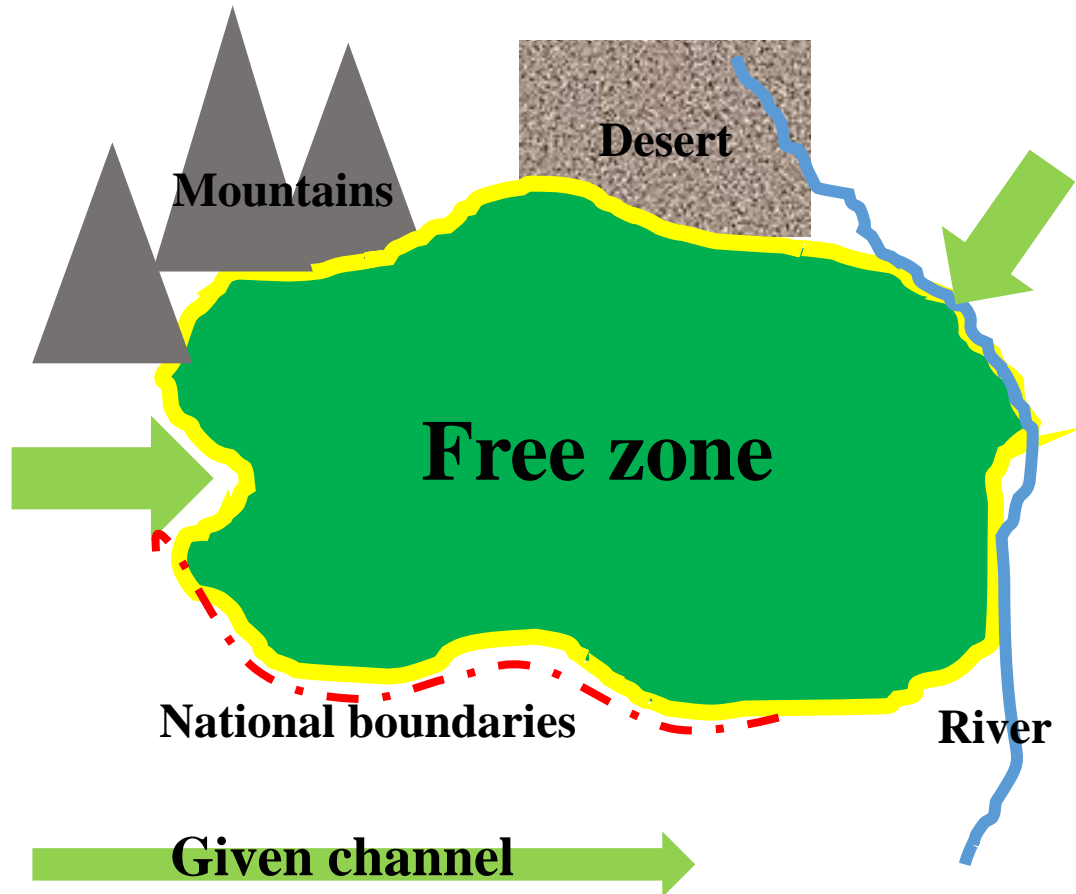


In 2001, China adopted vaccine immunization as the main prevention and control measure. With the industrialization of prevention and control products, the spread of foot-and-mouth disease virus was curbed. At present, China is free from foot-and-mouth disease type Asia1 without vaccination , free from type A with vaccination for three consecutive years and type O is effectively controlled .





## 5. Keypoint in the construction FMD free zones



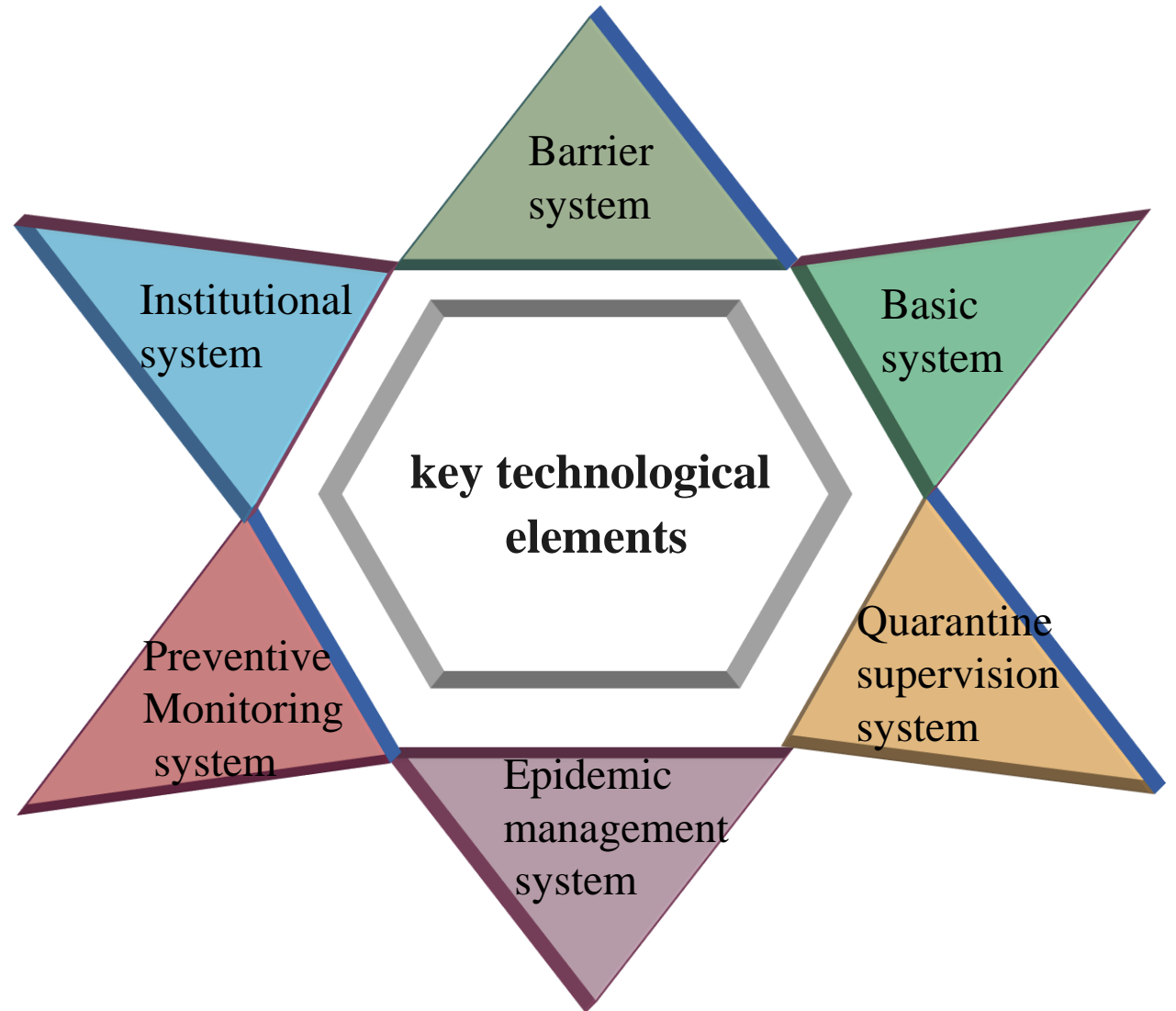
- ✓ **Comprehensive assessment (risk assessment) - delineation of areas**
- ✓ **Establish protected areas with natural or artificial barriers to prevent FMD**
- ✓ **Take effective biosecurity measures for susceptible animals in the area**
- ✓ **Basic conditions: There have been no outbreaks of FMD in the past 2 years; No FMDV transmission has been detected in the past 12 months.**





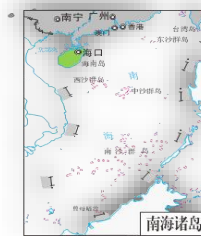
## 6. key technological elements in the construction FMD free zones

- **Barrier system construction**
- **Preventive Monitoring system**
- **Quarantine supervision system**
- .....
- **Vaccine immunization measures**
- **Monitoring confirmed no epidemic**





## 7. The progress of FMD- free zones construction in China



- Hainan Island (2009)
- Yongji County, Jilin Province (2012)
- Shandong Peninsula (2016)
- Jilin Province (2017)
- Shandong Province (2022)
- The Northeast without FMD  
( under Construction)



# **Section 2: Application of FMD disease vaccine in China**

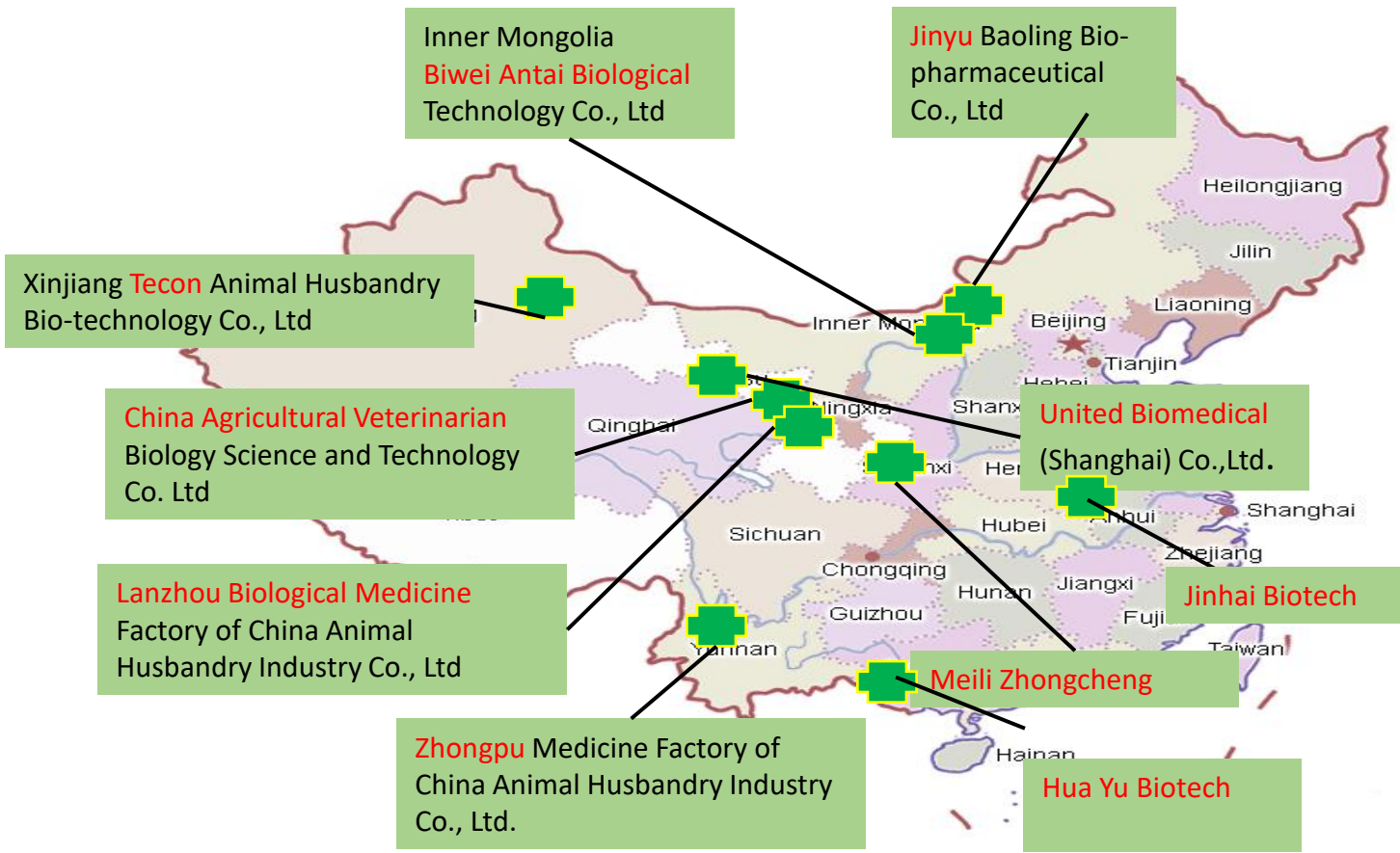


# 1. National FMD Laboratories network

- **National/WOAH Reference Laboratory for FMD**
  - Lanzhou Veterinary Research Institute, CAAS
  
- **National Professional Laboratory for FMD**
  - Yunnan Academy of Animal Husbandry and Veterinary Sciences
  - Chinese Center for Disease Control and Prevention
  - China Animal Health And Epidemiology Center



## 2. China's FMD vaccine manufacturers



➤ China has 10 FMD vaccine manufacturers with an annual capacity of 3 billion doses.

➤ Quality standard for FMD vaccine:  
PD50≥6.0 , Exceeding the WOA standard.





### 3. Summary of commercial FMD vaccine in China

Serial number	Name	Strain
1	Swine FMD(Type O) inactivated FMD vaccine	O/MYA98/BY/2010
2	Swine FMD (Type O and A) Bivalent Inactivated Vaccine	O/MYA98/BY/2010+O/PanAsia/TZ/2011+Re-A/WH/09
3	Swine FMD (Type O and A) Bivalent Inactivated Vaccine	Re-O/MYA98/JSCZ/2013+Re-A/WH/09
4	FMD (Type O and A) Bivalent Inactivated Vaccine	O/MYA98/BY/2010+Re-A/WH/09
5	FMD (Type O 、 A and Asia1) Trivalent Inactivited Vaccine	O/MYA98/BY/2010+Asial/JSL/ZK/06+Re-A/WH/09
6	FMD(Type O) inactivated FMD vaccine	O/JMS
7	FMD (Type O and A) Bivalent 3B protein epitope-deficient Inactivated	O/rV-1+A/rV-2
8	FMD(Type O and A) Bivalent virus-like particle vaccine	engineered vaccine
9	.....	.....



## 4. Key FMD Inactivated Vaccine



**The application of highly effective inactivated vaccines has contained FMD pandemic timely**

- **1. Swine FMD (Type O) inactivated FMD vaccine (O/MYA98/BY/2010)**

Successful control of foot-and-mouth disease in 2010, “Asia’s worst pandemic in 50 years” .

- **2. Swine FMD (Type O and A) Bivalent Inactivated Vaccine (Re-O/MYA98/JSCZ/2013+Re-A/WH/0)**

The world’s first FMD vaccine with reverse genetic technology has filled the gap in prevention and control technology and vaccine for swine type A FMD.

- **3. Swine FMD (Type O and A) Bivalent Inactivated Vaccine (O/MYA98/BY/2010+O/PanAsia/TZ/2011+Re-A/WH/09)**

The vaccine filled the immunity gap of PanAsia strain to achieve full coverage of epidemic strains.

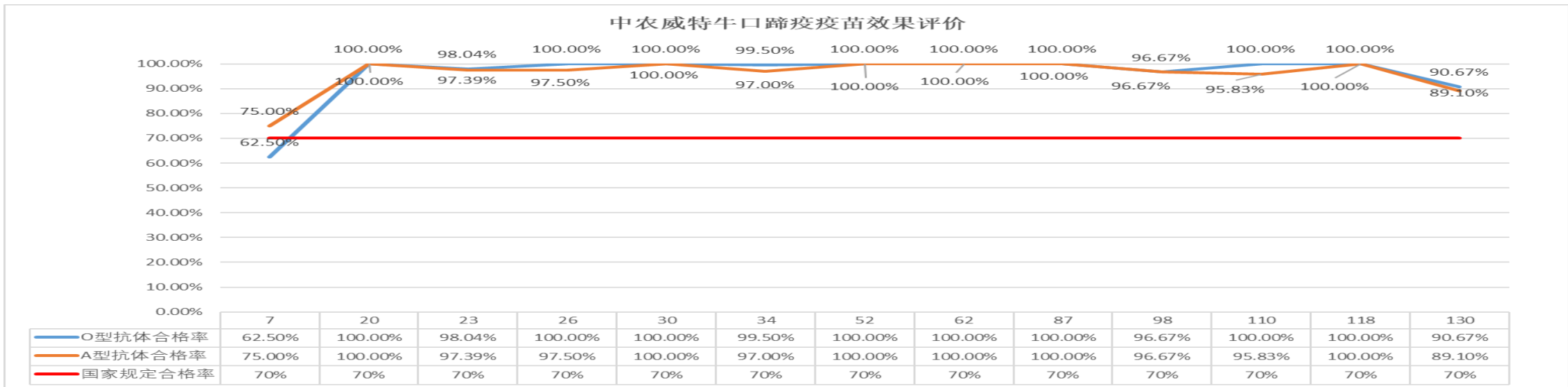
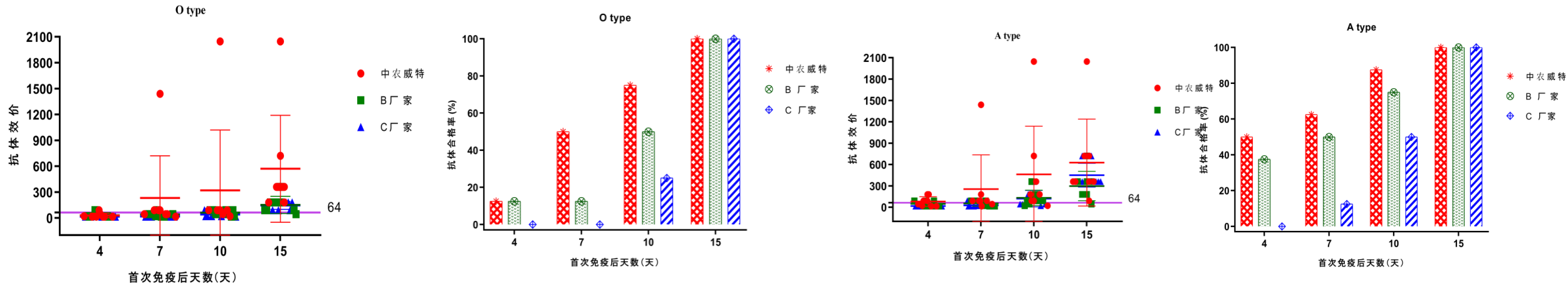
- **4. FMD (Type O 、 A and Asia1) Trivalent Inactivated Vaccine (O/MYA98/BY/2010+Asial/JSL/ZK/06+Re-A/WH/09)**

The use of the vaccine has achieved China free from FMD type Asia1 without vaccination.

- **5. FMD (Type O and A) Bivalent Inactivated Vaccine ( O/MYA98/BY/2010+Re-A/WH/09)**

The vaccine provides effective protection against MYA98, Pansia and Ind-2001 strains that harm cattle and sheep.

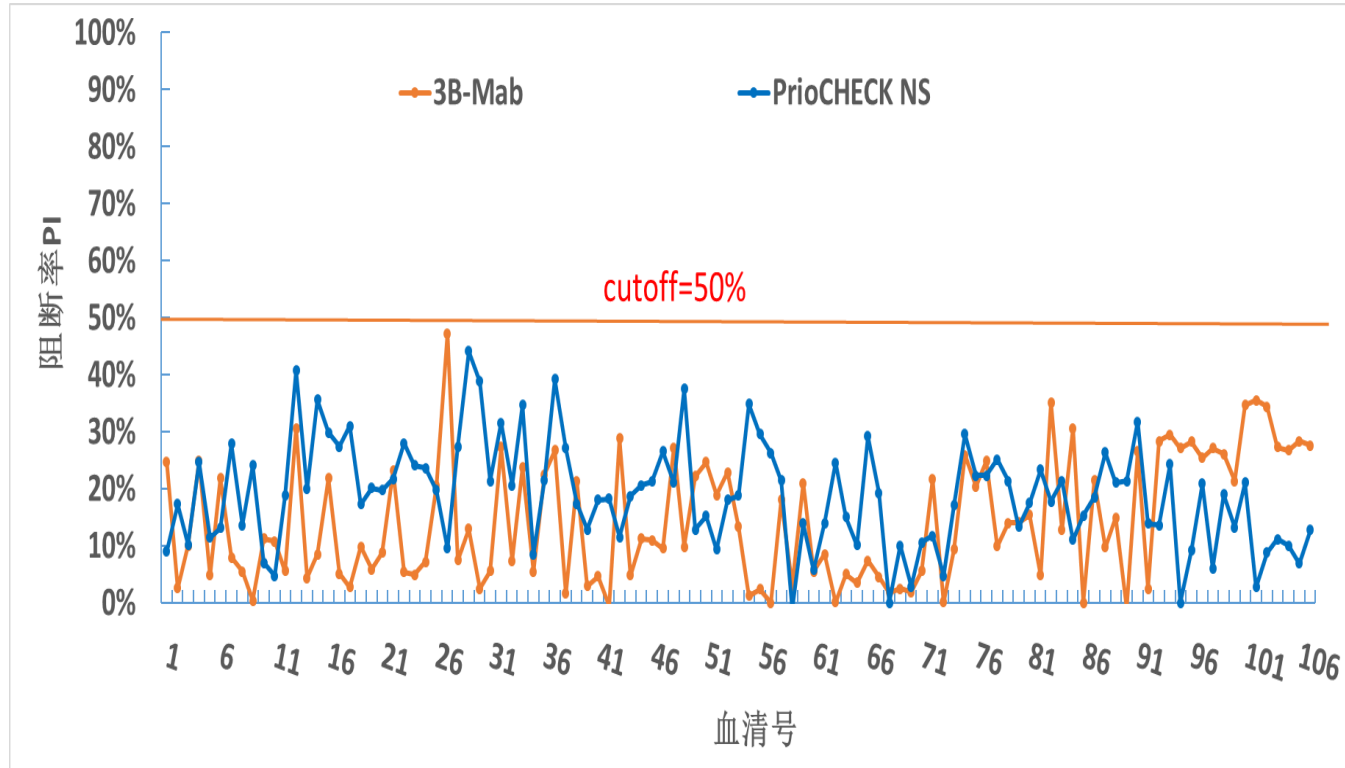
## 5. Immune effect of FMD vaccine





## 6. Distinguishing between infection and immunity helps the construction of FMD-free areas

### Non-structural protein 3ABC



### WOAH standard for purity of FMD vaccine :

The vaccine immunized animals with negative 3ABC antibody, indicating that the vaccine antigen purity is good, and 3ABC non-structural protein is completely removed, providing support for the construction of foot and mouth immunization free area.

The vaccine has been removed 3ABC non-structural proteins, solves the differential diagnosis problem of artificial immunity and natural infection, and makes significant contribution to the construction of FMD free areas in China.



# **Section3: China's contribution to SEACFMD**





# 1. SEACFMD



➤ China joined the SEACFMD program in May 2010.

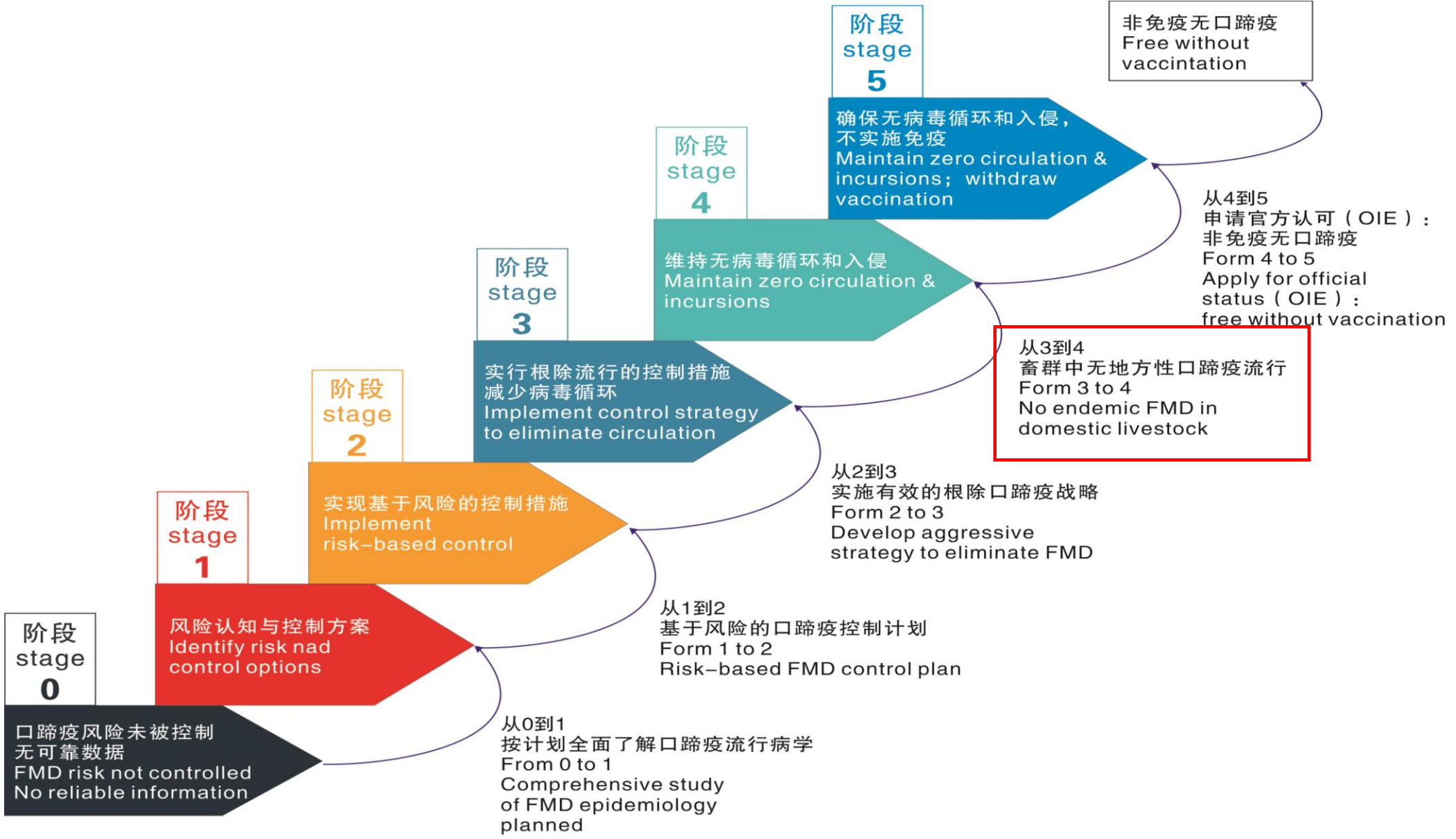
➤ By joining the SEACFMD program, China can make use of WOAHA technology resources to improve the prevention and control capacity of FMD in China.

➤ It is conducive to strengthen cooperation with WOAHA and promote China's veterinary work to be in line with international standards.

➤ It will help promote cooperation between China and Southeast Asian countries. We will improve the joint prevention and control mechanism for cross-border animal diseases to better ensure the safety of breeding production and veterinary public health.



# 2. China FMD-PCP development stage





### 3. Foreign aid for FMD vaccine

중국동방과학기술기수출입집단유한공사 앞

중국정부의 위임에 따라 중국동방과학기술기수출입집단  
유한공사에서 조선민주주의인민공화국 농업성에 제공하는  
구제역방역물자들이 주체 103(2014)년 7 월 14 일에 서명한  
구제역방역물자항목 제공계약서에 준하여 정확히 인수  
되었음을 확인합니다.

조선민주주의인민공화국  
농업성 수의방역국  
주체 104(2015)년 4 월 28 일

TO: DR ZHENG HAIXUE - DIRECTOR GENERAL  
LANZHOU VETERINARY RESEARCH INSTITUTE

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E-mail: info@ivm.mn

Date 2022, May 24  
Ref. 02/126

Excellency

Please accept our appreciation and thanks for the timely and urgent support to the veterinary service of Mongolia in its fight against Foot-and-Mouth disease outbreaks in our livestock.


The world are still facing the effects and aftermath of the SARS-CoV2/Covid-19 outbreak that affects all spheres of our lives and businesses.

It is therefore with our greatest appreciation and heartfelt thanks on your urgent and timely support in supplying us with 146S antigen concentrate of FMD to the Institute of Veterinary Medicine, Mongolia, to allow us to conduct and conclude the experimental phase of our reformulation and re-constitution of the concentrate towards vaccine.

We received the 146S FMD antigen concentrate from Lanzhou through Beijing and Seoul on route to Ulaanbaatar. This allowed us to conduct the experiment to evaluate the current emergency vaccine formulating facility at the national vaccine factory (Biokombinat).

Please receive our warmest wishes, in particular to the Lanzhou Veterinary Research Institute, CAS which is the OIE reference laboratory for Foot and Mouth diseases and I am truly hoping that we can enhance our future collaboration regarding.

Please allow me once again to express my deepest appreciation and warmest greetings

Truly Yours  
  
Professor Battsetseg Badgar, DVM., PhD,  
Academician Mongolian academy of Agricultural Science

- The effectiveness of the Swine FMD (Type O) inactivated vaccine provided by CAVET was highly praised by the North Korea.
- The use of FMD (Type O and A) Bivalent Inactivated Vaccine from CAVET has provided great help for the rapid control of FMD epidemic dominated by O/Ind-2001e strain in Mongolia.



## 4. Joint prevention and control of FMD

**CHINA AGRICULTURAL VET.  
BIO. SCIENCE AND TECHNOLOGY CO., LTD.**

ADD: XUJIAPING 1, LANZHOU, GANSU, CHINA  
TEL: 86-931-8342487 FAX: 86-931-8340173

### CERTIFICATE OF ANALYSIS

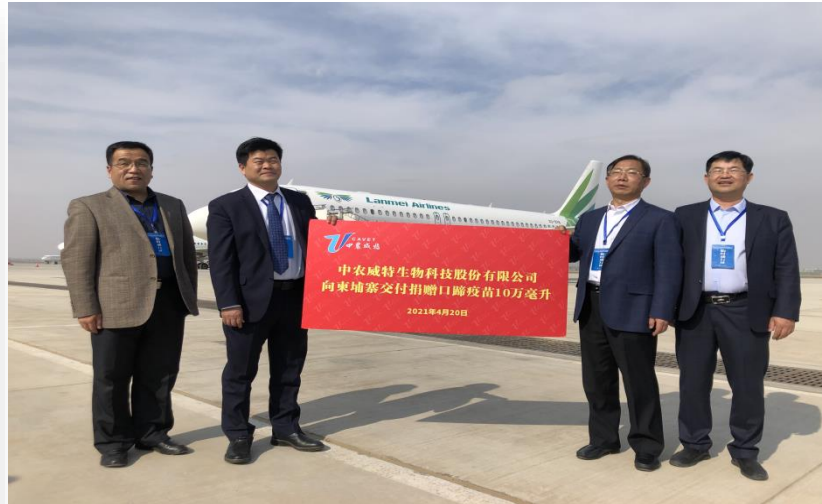
REPORT NO.: ZJB101004J  
DATE: DEC. 7, 2010

Name of commodity: FMD (type O, Asia 1) bivalent vaccine inactivated  
Batch No.: B101004J Quantity: 5,885,000ML  
Manufacturing date: Oct. 20, 2010 Expiry date: Oct. 20, 2011

No.	Items of Test	Test date		Result	Conclusion:
		From	To		
1	Appearance	2010.10.28	2010.10.28	Pink milk-like fluid, no layer	Conform
2	Viscosity	2010.10.28	2010.10.28	Vertical flow down 0.4ml need 3.03 seconds by 1ml straw	Conform
3	Preparation	2010.10.28	2010.10.28	Bidirectional, drop on surface & show spread cloudily	Conform
4	Stability	2010.10.28	2010.10.28	3000rpm centrifugation 15 min separate out watery 0.01ml	Conform
5	Asepsis	2010.10.21	2010.10.29	5/5 no germ	Conform
6	Safety	2010.10.22	2010.11.01	2/2 safe with guinea pig, 3/3 safe with cattle, 5/5 with small white mouse	Conform
7	Potency	2010.10.24	2010.11.24	O: 8.06PD50/dose; Asia I: 7.63PD50/dose	Conform

Remarks: This inspection is subject to our FMD quality control standard.

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SCIENCE AND TECHNOLOGY CO., LTD.



➤ China's inactivated FMD vaccine has a good effect after immunization in Vietnam, effectively resisted the occurrence FMD, and has played a significant role in ensuring the development of aquaculture in Vietnam.

➤ Lanzhou Veterinary Research Institute and CVET took the initiative to donate 100000 doses of FMD trivalent inactivated vaccines to Cambodia in 2021 for the prevention and control of FMD in cattle and sheep.



# **Section 4 : China Agricultural Veterinary Biotechnology Co., Ltd. ( CAVET ) introduction**





# 1. Historical evolution of CAVET

**1958**

Lanzhou Veterinary Research Institute's Foot and Mouth Disease Laboratory promotes China's first inactivated FMD vaccine .

**1975**

LVRI Built pilot workshop for FMD vaccine .

**1995**

LVRI has built the first domestic GMP production workshop for FMD vaccines.

**2002**

The GMP production workshop for FMD vaccines has been renamed as the Biological Products Factory of LVRI, Chinese Academy of Agricultural Sciences.

**2003**

CAVET was established on the basis of the Biological Products Factory of LVRI, Chinese Academy of Agricultural Sciences .

**2007**

The vaccine was exported to other country for the first time.  
The total foreign exchange is 7.569 million yuan.

**2010**

Investing 600 million yuan to build Tianjin Vet Biological Science and Technology Co.,Ltd, which dedicating to research , develop, product biological products such as animal genetic engineering vaccines .

**2014**

The first large-scale fully suspended culture production line of FMD vaccine with independent intellectual property right in China, independently developed and built by CAVET, has been officially used.

**2018**

The Biomedical Base of CAVET with investment budget of 1.06 billion yuan built in Yuzhong Park, Lanzhou High tech Zone.

**2020**

The biosafety series of projects have passed inspection and are officially put into use.

**2022**

The subunit vaccine workshop has passed static acceptance.

# 2. Qualification certificate





### 3. Research and development strength

**Lanzhou Veterinary Research Institute, CAVET faces national major needs**  
**Key technological breakthroughs and major product creation capabilities**

#### Ranking of the registration certificate of Class I new veterinary drug

Unit Name	quantity
Lanzhou Veterinary Research Institute, Chinese Academy of Agricultural Sciences	8
Shanghai Veterinary Research Institute, Chinese Academy of Agricultural Science	3
Harbin Veterinary Research Institute, Chinese Academy of Agricultural Sciences	3
Fujian Academy of Agricultural Sciences	3
Beijing Academy of Agriculture and Forestry Sciences	2
China Agricultural University	2
East China University of Science and Technology	2
Huazhong Agricultural University	1

- 49 new veterinary drug certificates of Class II and III
- 444 invention patents were authorized
- 24 international patents
- 19 national and industry standards have been formulated

Obtained 8 Class I new veterinary drug certificates. Rank first in the country



## 4. FMD vaccine production workshop



**Vaccine production line is automated, digitized, intelligent, pipeline based, and fully enclosed.**

**The production workshop has a large scale and high production capacity, with an annual production capacity of 1.5 billion doses.**



# Summary

- 1. FMD is still endemic in many parts of the world, and practice has proved that effective vaccine immunization can control large-scale outbreaks and epidemics of FMD. 。**
- 2. The Chinese government has always attached great importance to the prevention and control of FMD, and has long adhered to the comprehensive prevention and control measures of "prevention first, combining immunization and culling", and achieved world-recognized results.**
- 3. Lanzhou Veterinary Research Institute and CAHRI are important components of China's major animal disease prevention and control system. They play a leading role in overcoming difficulties in the field of animal disease prevention and control, and have made outstanding contributions, especially in the FMD.**
- 4. We are willing to strengthen international veterinary cooperation, jointly improve the cross-border animal disease joint prevention and control mechanism, promote the implementation of the WOAH global FMD prevention and control strategy, and better ensure the production of animal husbandry and veterinary public health safety.**





# Thank you

**Lanzhou Veterinary Research Institute,  
Chinese Academy of Agricultural Sciences  
China Agricultural Veterinary  
Biotechnology Co., Ltd.**



**Private Sector Consultative Committee (PSCC) Virtual Meeting**