



Recent progress in prevention and control of FMD in large scale livestock farms in China

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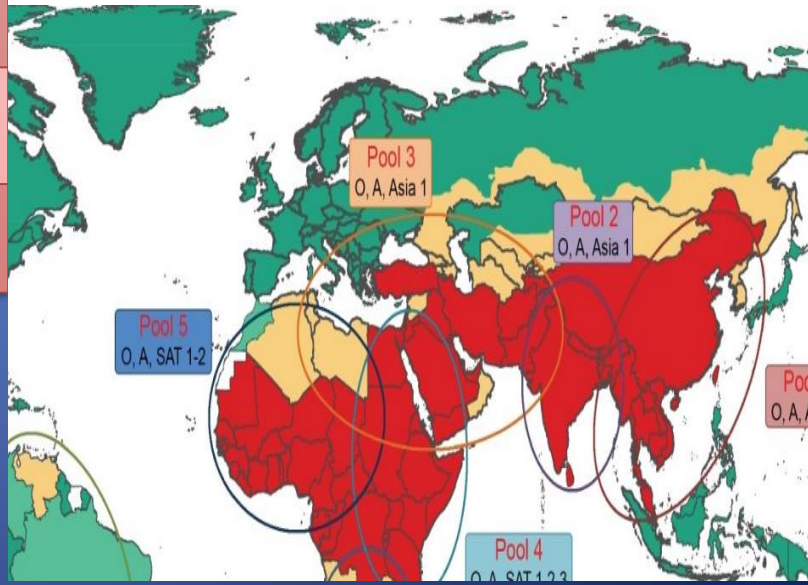
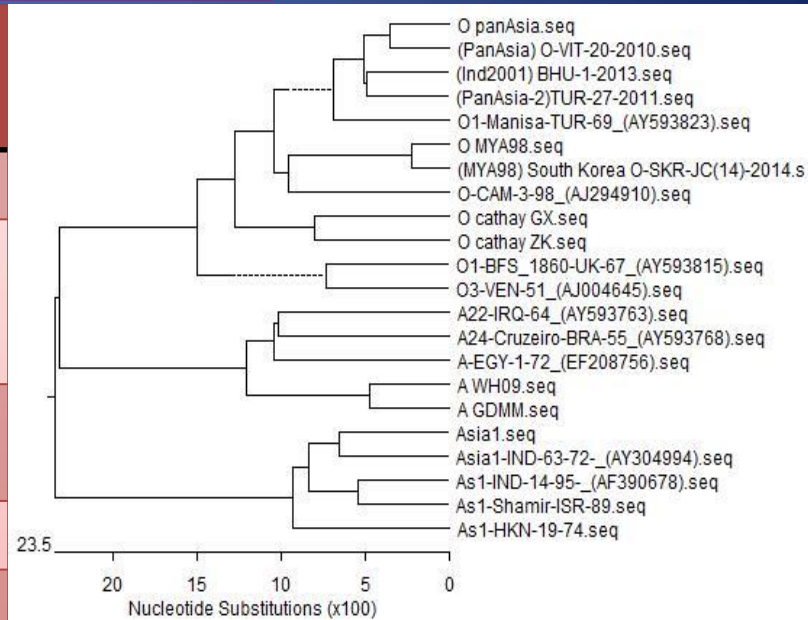
Part1: FMD epidemic situation in China

Serotype and topotype epidemic in China since 1999

Year	O Serotype	A Serotype	Asia1 Serotype
Before 1999	Cathay (O/or-80,O/GX-07)		
1999-2000	Pan-Asia (O/JMS-2000)		
2004			G-V(Asia1/JSL05)
2009	Mya98(O/BY-2010)	SEA-97 G1(A/WH-09)	No case since then
2013		SEA-97 G2 (A/GDMM13)	
2017	Ind-2001d		

Since 2000, the epidemic of FMD has been more and more complicated, and there have been three serotypes (O, A, Asia1) epidemic or sporadic so far.

2017/11/17



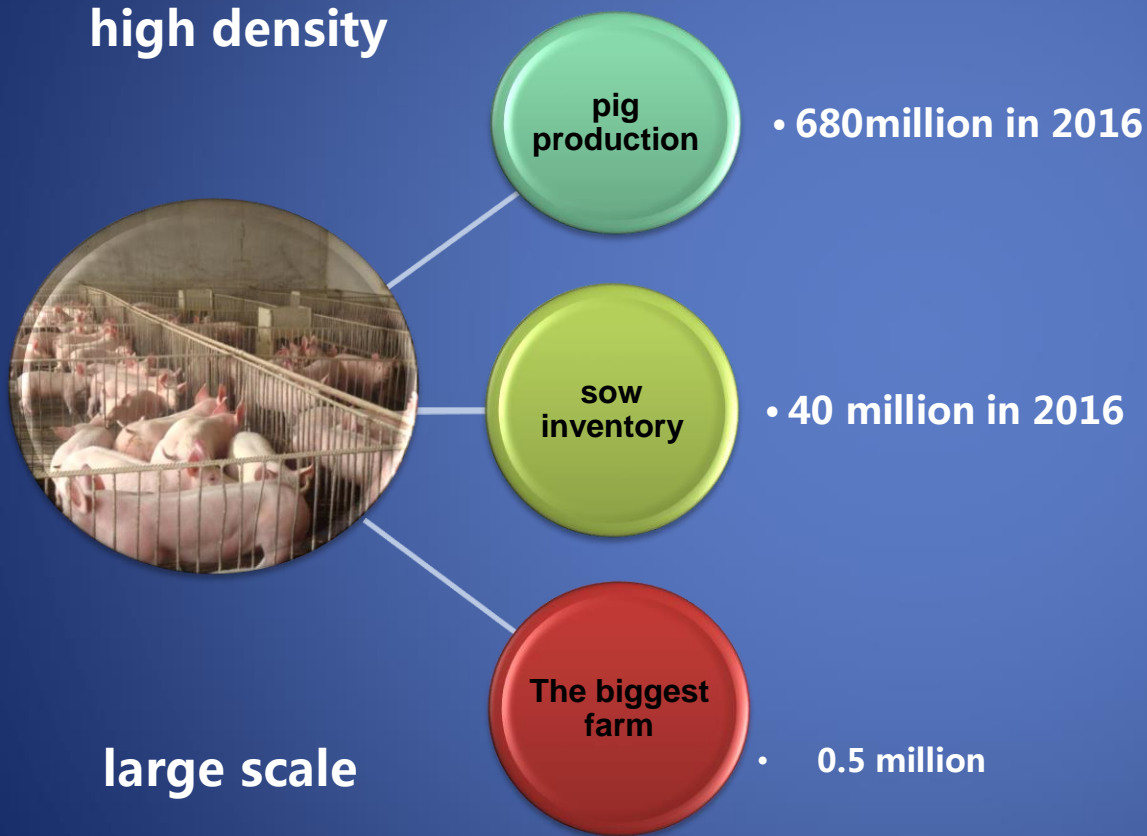


Part2: Challenge of FMD prevention and control in large scale farms in China

1、 Large scale farms in China



1) Pig breeding size and amount of farms

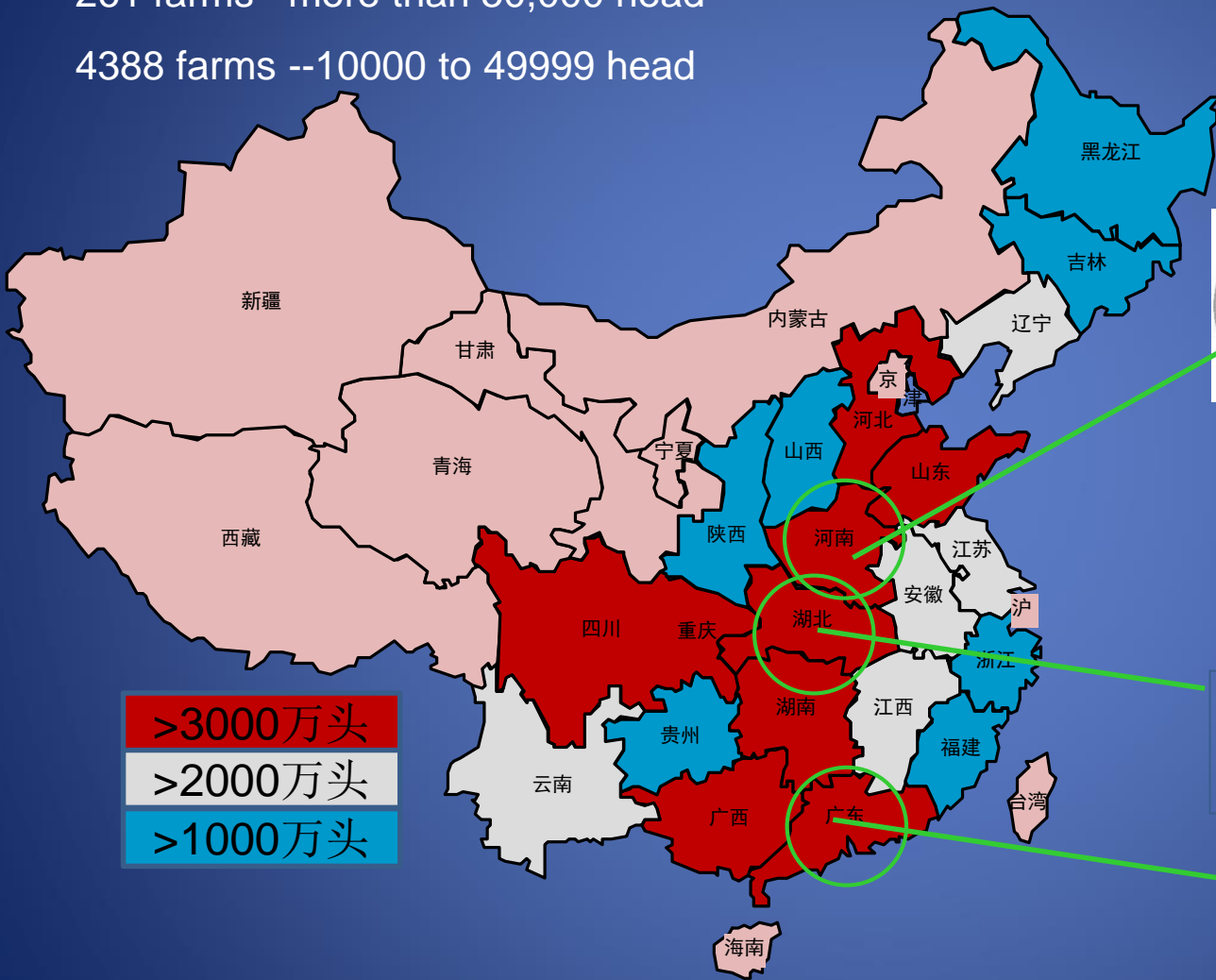




1、 Large scale farms in China

261 farms –more than 50,000 head

4388 farms --10000 to 49999 head



- >3000万头
- >2000万头
- >1000万头

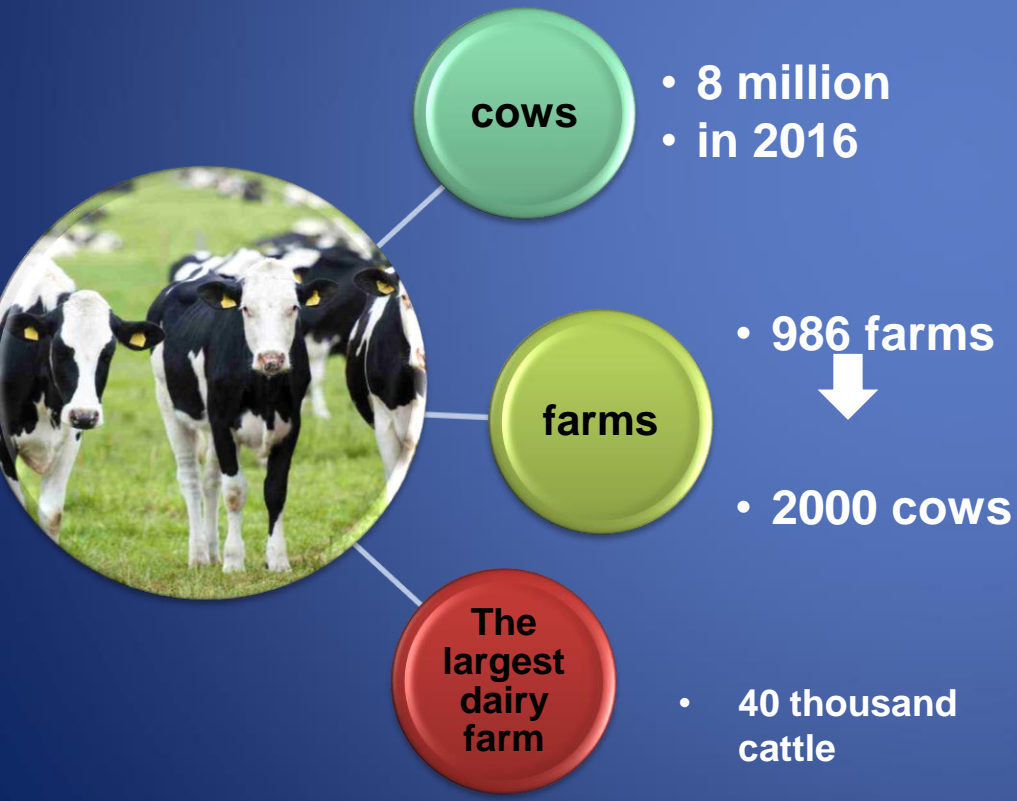




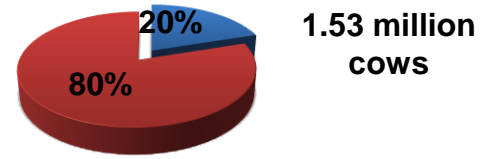
1、 Large scale farms in China

2) Large scale dairy farms:

The total number of cows is about 8 million and there are nearly 1000 farms with more than 2000 cows



cattle farm scale



■ the largest 20 dairy enterprises ■ others



2、 Challenge of FMD prevention and control in large scale farms in China

The large-scale farms are facing the great challenges of FMD control, because of:

CHALLENGE

Vast territory, breed variety, cross-breeding of various livestock, and multiple breeding patterns

Very large and high density breeding brings great risk of biological safety

The presence of other diseases in the farm

The risks to introduce of new topotypes of FMD strains from the adjacent regions



3、 The older type of FMD vaccines cannot meet the needs of FMD control in large-scale enterprises

Before 2010, the following problems existed in the production of FMD vaccines in China.



Disadvantages of traditional vaccine

Outdated upstream and downstream process

The safety of vaccines were extremely poor



Low efficacy often leading to inadequate level of protection and immune failure

Therefore, large-scale farms were urgently demanding high quality FMD vaccines.

Part3: Upgrading of the Process and the Development of high quality vaccines



Take the lead in upgrading the production process and product quality of vaccines

Upstream process completed in 2008.

Downstream process completed in 2009.

Determination of critical technical parameters, active detection and monitoring of key stages in the whole production process

Quantitative and quality tests of finished vaccines.



Part 4 :Characteristics of highly effective vaccine and its application

High safety

- Non FMDV proteins <200µg/dose
- Endotoxins <1EU/dose

High potency

- High payload antigen, O>18ug/dose; A>12ug/dose
- Inducing innate immunity at 4-5 days
- High antibody titer
- a longer duration of immunity

DIVA vaccine

- removal of 3ABC NSP

Endotoxin	<1EU/dose
Non FMDV protein	<200µg/dose
3ABC antibody	Not detected
Total antigen payload	20-50µg
Potency (PD50/dose)	30-80
Duration of antibody	5-6 months
Rapid immune response	4-7 days





Vaccination efficacy in large scale farms

Antibody titer of animals vaccinated from 2011 to 2016

(Antibody positive cutoff 1:128 by Lpb-LELISA)

From 2011-2016, 0.5 billion doses of Jinyu high payload vaccine have been used for pigs and 16 million doses for cows. Antibody titer positive rate was more than 90% for sows, 80% for finishing pigs and 95% for cows respectively. There is good cross protection to Ind2001 and there are no reports of FMD outbreaks in these cattle farms.

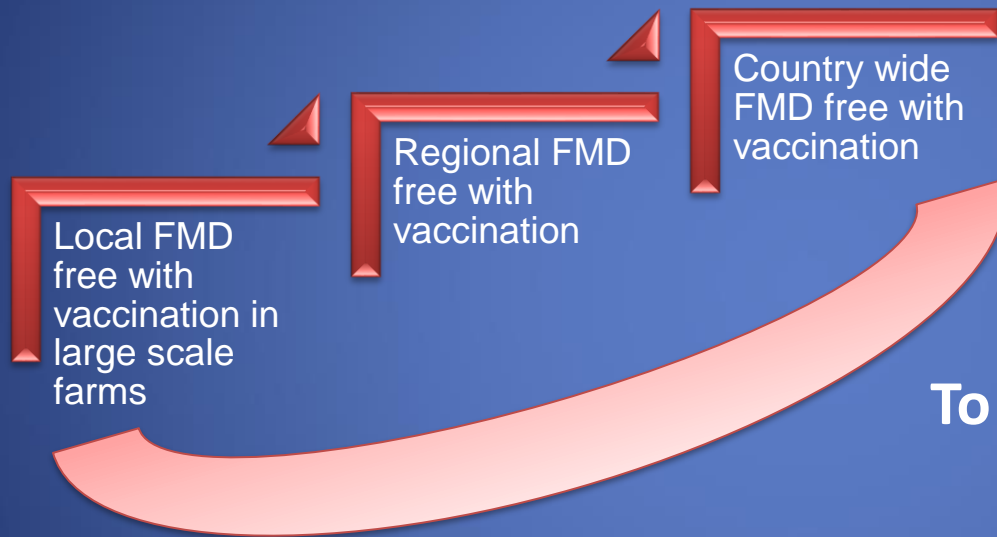
Sows				Fattening pigs			
Year	Number of Samples	O serotype antibody	A serotype antibody	Year	Number of Samples	O serotype antibody	A serotype antibody
		Rate of reaching standard	Rate of reaching standard			Rate of reaching standard	Rate of reaching standard
2012	2992	93.25%	--	2012	3325	82.71%	--
2013	2889	95.64%	91.07%	2013	3433	85.64%	80.69%
2014	2920	95.72%	90.65%	2014	3245	86.29%	81.66%
2015	4282	94.63%	93.69%	2015	6488	85.79%	81.52%
2016	4022	94.11%	92.44%	2016	5747	87.12%	82.44%
total	17105	94.52%	92.17%	total	22238	85.72%	81.67%

Cattle				
Year	Number of Samples	Rate of reaching standard		
		O	Asia1	A
2012	3446	95.76%	--	96.17%
2013	3668	95.99%	95.99%	95.97%
2014	3808	95.48%	95.30%	96.09%
2015	3898	97.26%	95.31%	97.18%
2016	6639	96.87%	95.26%	96.67%
total	21459	96.37%	95.43%	96.46%

Part5: The Future of FMD Prevention and Control in China



Commercial and other pressures on small farms is resulting in fewer and fewer small farms surviving. So, eventually, the farming industry will be composed only of large scale farming premises.



To achieve this will require

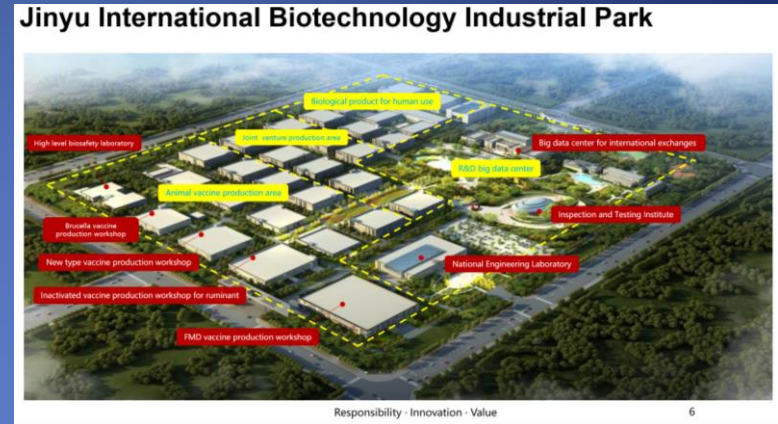
- High quality and high density immunization campaign
- strengthening the predicting and forecasting of FMD and the early warning and the reporting of outbreaks

Control and prevention in China will benefit from collaborations with all neighboring countries and regions.

Part5: The Future of FMD Prevention and Control in China



- JINYU is totally committed in the achievement of these goals and will continue to provide support for the Chinese farming community and the government veterinary authorities through the supply of high quality FMD vaccines.



Jinyu International Biotechnology Industrial Park is being built now. It will be the animal vaccines production base for swine, ruminants, poultry, and companion animals.



“One world, one disease, one health”!!!

