2014
International Workshop on Feral Swine Disease and Risk Management

By Hongxuan He
Feral swine diseases prevention and control in China

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COORDINATOR OF ASIA PACIFIC NETWORK OF WILDLIFE BORNE DISEASES
Feral swine in China
Scientific name: *Sus scrofa* Linnaeus

Common name: Wild boar, wild hog, feral swine, feral pig, feral hog, Old World swine, razorback, Eurasian wild boar, Russian wild boar

Feral swine is one of the most widespread group of mammals, which can be found on every continent except Antarctica.
World distribution of feral swine

Reconstructed range of feral swine (green) and introduced populations (blue). Not shown are smaller introduced populations in the Caribbean, New Zealand, sub-Saharan Africa and elsewhere.
Species of feral swine

Now, there are 4 genera and 16 species recorded in the world today.

<table>
<thead>
<tr>
<th>Western genus</th>
<th>Indian genus</th>
<th>Eastern genus</th>
<th>Indonesian genus</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Sus scrofa scrofa</em></td>
<td><em>Sus scrofa davidii</em></td>
<td><em>Sus scrofa sibiricus</em></td>
<td><em>Sus scrofa vittatus</em></td>
</tr>
<tr>
<td><em>Sus scrofa meridionalis</em></td>
<td><em>Sus scrofa cristatus</em></td>
<td><em>Sus scrofa ussuriicus</em></td>
<td></td>
</tr>
<tr>
<td><em>Sus scrofa algira</em></td>
<td><em>Sus scrofa leucomystax</em></td>
<td><em>Sus scrofa riukiuanus</em></td>
<td></td>
</tr>
<tr>
<td><em>Sus scrofa Attila</em></td>
<td><em>Sus scrofa taivanus</em></td>
<td><em>Sus scrofa moupinensis</em></td>
<td></td>
</tr>
<tr>
<td><em>Sus scrofa nigripes</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Sus scrofa libycus</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Sus scrofa majori</em></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Feral swine has a long history in China. About 10,000 years ago, Chinese began to domesticate feral swine.
Feral swine in China

Domesticated history in China

oracle bone inscriptions of “猪” in
Shang Dynasty

Different font of “猪”
Feral swine in China

Domesticated history in China

The carving of pig in Han Dynasty
In ancient time, people domesticated pig in “Zhu juan”.

Feral swine in China

Domesticated history in China
Feral swine in China

Species of feral swine
- Northeast subspecies S.s. ussuricus
- North China subspecies S.s. cristatus
- South China subspecies S.s. chirodonticus
- Xinjiang subspecies S.s. nigrip
- Mongolian subspecies S.s. cristatus
- Taiwan subspecies S.s. taivanus
- Indosinian subspecies S.s. taininensis

Now, there are 1 kind of 7 subspecies in China.
Feral swine in China

The distribution of feral swine in China

- Xinjiang subspecies S.s. nigrip
- Indosinian subspecies S.s. taininis
- Mongolia subspecies S.s. cristatus
- North China subspecies S.s. cristatus
- Northeast subspecies S.s. ussuricus
- South China subspecies S.s. chirodonticus
- Taiwan subspecies S.s. taivanus
### Distribution of Feral Swine in China

<table>
<thead>
<tr>
<th>Province</th>
<th>Area</th>
<th>Density</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beijing</td>
<td>1142</td>
<td>0.04</td>
<td>50</td>
</tr>
<tr>
<td>Shanxi</td>
<td>—</td>
<td>0.0119~0.2023</td>
<td>8000</td>
</tr>
<tr>
<td>Hebei</td>
<td>—</td>
<td>0.0007088</td>
<td>3000</td>
</tr>
<tr>
<td>Neimenggu</td>
<td>210000</td>
<td>0.2574</td>
<td>54000</td>
</tr>
<tr>
<td>Liaoning</td>
<td>—</td>
<td>0.0052~0.0125</td>
<td>600</td>
</tr>
<tr>
<td>Jilin</td>
<td>85900</td>
<td>0.2846</td>
<td>25000</td>
</tr>
<tr>
<td>Heilongjiang</td>
<td>290911</td>
<td>0.0909</td>
<td>26000</td>
</tr>
<tr>
<td>Jiangsu</td>
<td>—</td>
<td>—</td>
<td>100000</td>
</tr>
<tr>
<td>Fujian</td>
<td>—</td>
<td>—</td>
<td>100000</td>
</tr>
<tr>
<td>Jiangxi</td>
<td>81850</td>
<td>2.292</td>
<td>360000</td>
</tr>
<tr>
<td>Henan</td>
<td>—</td>
<td>0.4302~0.5938</td>
<td>46000</td>
</tr>
<tr>
<td>Hubei</td>
<td>87554</td>
<td>1.5982</td>
<td>140000</td>
</tr>
<tr>
<td>Hunan</td>
<td>—</td>
<td>0.09896</td>
<td>13000</td>
</tr>
<tr>
<td>Guangdong</td>
<td>—</td>
<td>0.51~1.14</td>
<td>50000</td>
</tr>
<tr>
<td>Guangxi</td>
<td>232600</td>
<td>0.058~0.134</td>
<td>12000</td>
</tr>
<tr>
<td>Hainan</td>
<td>—</td>
<td>—</td>
<td>500</td>
</tr>
<tr>
<td>Chongqing</td>
<td>24308</td>
<td>—</td>
<td>350</td>
</tr>
<tr>
<td>Sichuan</td>
<td>—</td>
<td>0.1249~0.2757</td>
<td>8800</td>
</tr>
<tr>
<td>Guizhou</td>
<td>176167</td>
<td>0.2108</td>
<td>36000</td>
</tr>
<tr>
<td>Yunnan</td>
<td>13730</td>
<td>—</td>
<td>32000</td>
</tr>
<tr>
<td>Xizang</td>
<td>—</td>
<td>0.0442</td>
<td>4900</td>
</tr>
<tr>
<td>Shanxi</td>
<td>45637</td>
<td>0.8948</td>
<td>40000</td>
</tr>
<tr>
<td>Gansu</td>
<td>—</td>
<td>0.00535~0.22752</td>
<td>9000</td>
</tr>
<tr>
<td>Ningxia</td>
<td>1600</td>
<td>0.386</td>
<td>300</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td>1000000</td>
</tr>
</tbody>
</table>
Feral swine in China

In ancient time, pigs represent auspiciousness, festival and good fortune. At the same time, feral swine represents brave and strong. About 10,000 years ago, Chinese began to domesticate feral swine for meat products.
Feral swine has been listed in the state forestry administration released on August 1, 2000, “the list of terrestrial wildlife which is beneficial or has important economic and scientific research value”. It belongs to the animals under state protection (category ii). Now, feral Swine in China is expanding their range, both on their own and with human assistance. We should take measures to control their quantity.
Diseases of feral swine
As it is reported, domestic swine host about 21 kinds of bacterium, 18 kinds of viruses and 37 kinds of different parasitic species. Some of diseases can transmit in feral swine.
Diseases of feral swine

Viral Diseases
- Swine influenza (SI)
- Classical swine fever
- Food and mouth disease (FMD)
- Vesicular stomatitis
- Porcine parvovirus disease
- ……

Bacterial Diseases
- Brucellosis
- Anthrax of swine
- Tuberculosis
- Swine erysipelas
- Swine pasteurellosis
- ……

Parasitic species
- Trichinosis
- Cysticercosis cellulosae
- Ascariosis of swine
- Toxoplasmosis
- Sarcoptidosis
- ……
Diseases of feral swine

- Parasitic species: about 37
- Viruses: about 18
- Bacterium: about 21
Influenza is caused by RNA viruses of the family *Orthomyxoviridae*, the influenza viruses.

<table>
<thead>
<tr>
<th>Orthomyxovirus</th>
<th>Virus classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group</td>
<td>Group V ((-)ssRNA)</td>
</tr>
<tr>
<td>Order</td>
<td>Unassigned</td>
</tr>
<tr>
<td>Family</td>
<td>Orthomyxoviridae</td>
</tr>
</tbody>
</table>

Feral swine serves as a major reservoirs of H1N1, H3N2, H5N1 and H7N9 influenza viruses which are endemic in feral swine populations worldwide.
Diseases of feral swine

Influenza

*Total Samples = Sum of samples positive for A(H1), A(H3), A(Pandemic H1N1), A (subtyping not performed), and B.
Feral swine can be infected by both avian viruses and human viruses, and as an intermediate host in which viruses can reassort. Feral swine also serves as an adaptation host in which avian viruses can mutate to become more infectious for humans.
Diseases of feral swine

Foot and mouth disease is caused by FMD virus (FMDV) an RNA virus of the genus *Aphthovirus* of the *Picornaviridae* family.

<table>
<thead>
<tr>
<th>Foot-and-mouth disease virus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Virus classification</td>
</tr>
<tr>
<td>Group:</td>
</tr>
<tr>
<td>IV ((+)ssRNA)</td>
</tr>
<tr>
<td>Order:</td>
</tr>
<tr>
<td>Picornavirales</td>
</tr>
<tr>
<td>Family:</td>
</tr>
<tr>
<td>Picornaviridae</td>
</tr>
<tr>
<td>Genus:</td>
</tr>
<tr>
<td>Aphthovirus</td>
</tr>
<tr>
<td>Species:</td>
</tr>
<tr>
<td>Foot-and-mouth disease virus</td>
</tr>
</tbody>
</table>

The disease is characterized by high fever that declines rapidly after two or three days, blisters inside the mouth that lead to excessive secretion of stringy or foamy saliva and to drooling, and blisters on the feet that may rupture and cause lameness.
Diseases of feral swine

Countries in which FMD was reported to the OIE.

The distribution of type O in China
Diseases of feral swine

Foot and mouth disease

Feral swine may have a significant potential to spread the disease as infected animal may shed virus at high titers before clinical signs become apparent. Even after vesicles have developed on their feet, mobility may not be significantly impaired.
Classical swine fever (CSF) is caused by an RNA virus of the genus *Pestivirus* of the *Flaviviridae* family.

<table>
<thead>
<tr>
<th>Classical swine fever</th>
<th>Virus classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group:</td>
<td>Group IV (+)ssRNA</td>
</tr>
<tr>
<td>Family:</td>
<td>Flaviviridae</td>
</tr>
<tr>
<td>Genus:</td>
<td>Pestivirus</td>
</tr>
<tr>
<td>Species:</td>
<td>Classical swine fever virus</td>
</tr>
</tbody>
</table>

Classical swine fever causes fever, skin lesions, convulsions and usually (particularly in young animals) death within 15 days.
The percentages indicate the CSFV positivity rate of the province.

The role of feral swine in CSF is primarily of epidemiological interest since they are regarded as a reservoir for CSF virus (CSFV) and a possible source of infection for domestic pigs.
Porcine circovirus (PCV) is a single-stranded DNA virus (class II), that is nonenveloped with an unsegmented circular genome. The viral capsid is icosahedral and approximately 17 nm in diameter. PCV is a member of the virus family Circoviridae.

<table>
<thead>
<tr>
<th>Porcine circovirus</th>
<th>Virus classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group</td>
<td>Group II (ssDNA)</td>
</tr>
<tr>
<td>Family</td>
<td>Circoviridae</td>
</tr>
<tr>
<td>Genus</td>
<td>Circovirus</td>
</tr>
</tbody>
</table>

Porcine Circovirus Associated Disease is caused by porcine circovirus type 2 (PCV2)
Recently, several other complex syndromes, including reproductive failure, enteritis, pneumonia and necrotizing dermatitis, have also been linked to PCV2 infection. PCVAD is further complicated by coinfections with other bacterial and viral pathogens.
Diseases of feral swine

- Parasitic species: about 37
- Viruses: about 18
- Bacterium: about 21
Brucella is a genus of Gram-negative bacteria. They are small (0.5 to 0.7 by 0.6 to 1.5 µm), non-motile, non-encapsulated coccobacilli, which function as facultative intracellular parasites.

### Scientific classification

<table>
<thead>
<tr>
<th>Kingdom</th>
<th>Bacteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phylum</td>
<td>Proteobacteria</td>
</tr>
<tr>
<td>Class</td>
<td>Alphaproteobacteria</td>
</tr>
<tr>
<td>Order</td>
<td>Rhizobiales</td>
</tr>
<tr>
<td>Family</td>
<td>Brucellaceae</td>
</tr>
<tr>
<td>Genus</td>
<td>Brucella</td>
</tr>
</tbody>
</table>

In the first stage of the disease, septicaemia occurs and leads to the classic triad of undulant fevers, sweating, and migratory arthralgia and myalgia.
Diseases of feral swine

Brucellosis
Brucellosis is one of the most common zoonotic infections worldwide. In China, Brucellosis is mainly distributed in northeast region.

Brucellosis is caused by ingestion of unpasteurized milk or undercooked meat from infected animals or close contact with their secretions.
Anthrax is an acute disease caused by the bacterium *Bacillus anthracis*.

<table>
<thead>
<tr>
<th>Scientific classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domain:</td>
</tr>
<tr>
<td>Bacteria</td>
</tr>
<tr>
<td>Phylum:</td>
</tr>
<tr>
<td>Firmicutes</td>
</tr>
<tr>
<td>Class:</td>
</tr>
<tr>
<td>Bacilli</td>
</tr>
<tr>
<td>Order:</td>
</tr>
<tr>
<td>Bacillales</td>
</tr>
<tr>
<td>Family:</td>
</tr>
<tr>
<td>Bacillaceae</td>
</tr>
<tr>
<td>Genus:</td>
</tr>
<tr>
<td>Bacillus</td>
</tr>
<tr>
<td>Species:</td>
</tr>
<tr>
<td>B. anthracis</td>
</tr>
</tbody>
</table>
Diseases of feral swine

*Anthrax of swine*

*B. anthracis* can form dormant that are able to survive in harsh conditions for decades or even centuries. Such spores can be found on all continents, even Antarctica.
A species of Bacillus can cause anthrax in humans and in animals (cattle and swine and sheep and rabbits and mice and guinea pigs).
Diseases of feral swine

- Parasitic species: about 37
- Viruses: about 18
- Bacterium: about 21
Trichinella spiralis is a nematode parasite, occurring in rodents, pigs, bears and humans, and is responsible for the disease trichinosis.

<table>
<thead>
<tr>
<th>Scientific classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kingdom</td>
</tr>
<tr>
<td>Phylum</td>
</tr>
<tr>
<td>Class</td>
</tr>
<tr>
<td>Order</td>
</tr>
<tr>
<td>Superfamily</td>
</tr>
<tr>
<td>Genus</td>
</tr>
<tr>
<td>Species</td>
</tr>
</tbody>
</table>
Trichinella infects humans and other mammals throughout North America, parts of South America, central America, parts of Africa, Asia, New Zealand, and Tasmania.

Trichinella spiralis (T-1) (green) is the most common member of the genus.

Trichinella nativa (T-2) (yellow) is a Holarctic species with a very high resistance to freezing.

A Trichinella isolate, termed T-6 (red), is similar to T. nativa.

Trichinella pseudospiralis (T-4) (red dots) infects over a dozen species of mammals, birds and chickens.

The maps below show the distribution of various strains of Trichinella throughout the world.
Diseases of feral swine

Trichinosis

The red points show the numbers of reported or recorded human trichinellosis cases; each red point represents ≤10 cases. Green areas represent regions where a prevalence of pig trichinellosis has been recorded.

Most of the clinical (88.6%) and fatal (99.6%) cases occurred in regions (Yunnan, Guangxi and Tibet) where the habit of eating raw pork meat is common.
Feral swine become infected when they eat infectious cysts in raw meat, often pork or rats (sylvatic cycle). Humans become infected when they eat raw or undercooked infected pork (domestic cycle).
Toxoplasmosis is a parasitic disease caused by the protozoan *Toxoplasma gondii*.

<table>
<thead>
<tr>
<th>Scientific classification</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Superphylum</td>
<td>Alveolata</td>
</tr>
<tr>
<td>Phylum</td>
<td>Apicomplexa</td>
</tr>
<tr>
<td>Class</td>
<td>Conoidasida</td>
</tr>
<tr>
<td>Order</td>
<td>Eucoccidiorida</td>
</tr>
<tr>
<td>Family</td>
<td>Sarcocystidae</td>
</tr>
<tr>
<td>Subfamily</td>
<td>Toxoplasmatinae</td>
</tr>
<tr>
<td>Genus</td>
<td>Toxoplasma</td>
</tr>
<tr>
<td>Species</td>
<td>T. gondii</td>
</tr>
</tbody>
</table>
Toxoplasmosis is not a rare disease in China. Infection can transmit by ingestion of undercooked meat containing tissue cysts, especially pork, lamb, or venison and ingestion of cat (or other feline) feces contaminated with oocysts.
Diseases of feral swine

*T. solium* worms may reach a length of several meters. The scolex has four suckers, and a double crown of prominent hooks, which attach to the intestinal mucosa.

<table>
<thead>
<tr>
<th>Scientific classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kingdom: Animalia</td>
</tr>
<tr>
<td>Phylum: Platyhelminthes</td>
</tr>
<tr>
<td>Class: Cestoda</td>
</tr>
<tr>
<td>Order: Cyclophyllidea</td>
</tr>
<tr>
<td>Family: Taeniidae</td>
</tr>
<tr>
<td>Genus: Taenia</td>
</tr>
<tr>
<td>Species: <em>T. solium</em></td>
</tr>
</tbody>
</table>
Diseases of feral swine

Cysticercosis cellulosae

The global distribution of cysticercosis infection

Hot spots of infection, areas of high endemicity, are found in regions with high rates of pig product consumption.
Infection with the tapeworm is strongly associated with pig husbandry along with poor hygiene.

Accidentally ingested eggs can result in larva that migrate throughout the body eventually forming cysts.
Diseases of feral swine

Feral swine has behaviors and habitat preferences that bring them into contact with wild bird, poultry, wildlife and humans and make them vectors for many diseases transfer between and among species.

Feral swine can be infected by both wildlife viruses and human viruses, and as a intermediate host in which viruses can reassort. Feral swine also serve as adaptation hosts in which wildlife viruses can mutate to become more infectious for humans.
Prevention and control strategies
Prevention and control strategies

- Background investigation
- Disease control
- Conservation of feral swine
- International collaboration
Prevention and control strategies

Mainly Barrier in Developing Prevention Strategy
Among the infectious diseases, which ones are zoonosis, vector borned diseases, or natural resources diseases?

On the contrary, what kind of pathogens in feral swine would contaminate the environment?

How much diseases, including medical disease, surgery disease, metabolic disease and infectious disease?

How many pathogens does feral swine carries? And the same with its high frequency contacteers, such as human beings?

How much do we know about the reported feral swine-infectious diseases, such as etiology, pathology, epidemiology, molecular ecology?
How much unknown feral swine diseases?

- Relative to goat, cow and domestic swine, we lack an systematic cognition of feral swine diseases. There exist many other unknown diseases caused by unknown disease.
Among the infectious diseases, which ones are zoonosis, vector-borne diseases, or natural resources diseases?

• Infectious disease can be divided into endogenous infection and exogenous infection.

• For exogenous infection, it is pivotal important to clarify the source of infection.

<table>
<thead>
<tr>
<th>Zoonosis</th>
<th>Vector Borne Disease</th>
<th>Wildlife Borne Diseases</th>
<th>Other Diseases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Some diseases can be transmitted to feral swine by human</td>
<td>Diseases can be transmitted to by mosquito and bite</td>
<td>Feral swine could contact with mouse, bat, and many other animals, unexpected disease may infect feral swine</td>
<td>Endogenous infection, mostly caused by conditioned pathogen</td>
</tr>
</tbody>
</table>
Prevention and control strategies

Which factors affect feral swine diseases, and How this factors affect feral swine diseases?

- Land modification
- Vegetation patterns changes
- Vetor and host special dynamics
- microclimates
- human contact with domestic and wild animals
- Population density

Crucial factors in disease ecology
Prevention and control strategies

What do we know about the reported feral swine-infectious diseases, such as etiology, pathology, epidemiology, molecular ecology?

- Background investigation
  - Ecology investigation
  - Pathogenic ecology investigation
Prevention and control strategies

Strategy-making

Initiative protection
- Vaccine
- Database

Passive defensive
- Diagnose
- Treatment
Prevention and control strategies

Goal

01 Firstly developing a feral swine-infected disease database

02 Secondly Rapid detection, rapid diagnose and rational cure.

03 Thirdly Early warning system of feral swine disease.
Prevention and control strategies

- Feral swine
- Human beings
- Closely contactors
- Environment

Samples → Metagenomics

Ecology → Pathogen → Diagnose

Etiology → Pathology → Epidemiology

Pathogen database → Disease database

Pathogen database

Initiative protection
Vaccine.
Early warning of certain disease.
Take action on its closely contactors and environment.

Passive defensive
Rapid diagnose
Rational use of drugs
Develop new drugs

Diseases

Diagnose → Treatment
Prevention and control strategies

Rapid diagnose

- When a unknown disease occurred, how much dose it spends to give a correct diagnose?
- Rational use of drugs

<table>
<thead>
<tr>
<th>Molecular diagnose</th>
<th>Serum diagnose</th>
<th>Etiology diagnose</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCR</td>
<td>Monoclonal antibody</td>
<td>Biochemistry</td>
</tr>
<tr>
<td>Real-time PCR</td>
<td>Multiclonal antibody</td>
<td>BD Phoenix</td>
</tr>
<tr>
<td>LAMP</td>
<td>Colloidal gold test strip</td>
<td>SPR</td>
</tr>
<tr>
<td>Gene chip</td>
<td>PBA</td>
<td></td>
</tr>
</tbody>
</table>
Prevention and control strategies

Division of wildlife borne diseases management

Surveillance of disease

- Nationwide wildlife-borne disease surveillance

- General Station of Wildlife Diseases Monitoring

- National Research Center for Wildlife Borne Diseases

- MOH
  - Human
  - Wildlife Diseases

- SFA

- MOA
  - Domestic animal

- AQSIQ
  - Quarantine

National Council of P.R. CHINA
Prevention and control strategies

Establishing monitoring station network

Surveillance of disease

NMS 350
PMS 768
CMS > 2000
# Prevention and control strategies

Manage the population of feral pigs

<table>
<thead>
<tr>
<th>Establish the corresponding laws</th>
<th>Investigate population changes in feral pigs</th>
<th>Controlled hunting</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Feral swine belongs to the animals under state protection (category ii).</td>
<td>• Find the quantities of the optimal stock and the optimal harvest</td>
<td>• Keep the balance between their pest and resource status</td>
</tr>
</tbody>
</table>
The prevention and control of feral swine diseases is a tough work, which needs **closely cooperation** of different research departments.
Prevention and control strategies

- The 1st Workshop on Regional Surveillance and Research for Wildlife-Borne Diseases
- The 2nd Workshop on Regional Surveillance and Research for Wildlife-Borne Diseases
- The 3rd Workshop on Regional Surveillance and Research for Wildlife-Borne Diseases
- The 4th Workshop on Regional Surveillance and Research for Wildlife-Borne Diseases
- The 5th Workshop on Regional Surveillance and Research for Wildlife-Borne Diseases
- The 6th Workshop on Regional Surveillance and Research for Wildlife-Borne Diseases
- The 7th Workshop on Regional Surveillance and Research for Wildlife-Borne Diseases
Prevention and control strategies

Highlighted points

• We should protect the total ecosystem, not only focus our eyes on the feral swine itself. Only a harmony ecosystem supports healthy fairy in the natural reserve.

• The feral swine closely contactors, for example the migrating birds and other animals, should not carry the pathogen that can be sensitive to feral swine.

• For wild feral swines, it is important to perform etiology investigation in there habitat.

• Passive defensive against infectious disease is far from enough.
Prevention and control strategies

In order to solve those highlighted points, China has marched two national plans.

- National terrestrial wildlife resources survey for the second time
- National medium and long term plan for animal disease prevention and control
Prevention and control strategies

National terrestrial wildlife resources survey for the second time

The purpose of the wildlife resources investigation is to provide a scientific basis of protecting the development of wildlife resources in China. The wildlife resources investigation, on one hand, is the necessary measure to fulfill the need for the relevant departments to formulate the macroscopic policy, perform international obligations, carry out the international communication. On the other hand, it is essential to carry out the law of wildlife protection of PRC.
Prevention and control strategies

National terrestrial wildlife resources survey for the second time

From 2011 to 2015

- The present distribution of wildlife
- Wildlife habitat
- Wildlife populations and the change trend
- Threatening factors of wild animals and their habitats
- Present situation of wildlife and habitat protection
- Wildlife area socioeconomic status
- Wild animals domestication, breeding and trade status
Prevention and control strategies

National medium and long term plan for animal disease prevention and control

The state implements regionalization management for animal epidemics.
Prevention and control strategies

National medium and long term plan for animal disease prevention and control

Animal husbandry industry

FMD, PRRS, Classical swine fever
Prevention and control strategies

National medium and long term plan for animal disease prevention and control

Zoonoses epidemic area

Brucellosis
Prevention and control strategies

National medium and long term plan for animal disease prevention and control

High risk areas of foreign animal disease

- African swine fever
- Foot and mouth disease
- H7 subtype of avian influenza

African swine fever
Foot and mouth disease
H7 subtype of avian influenza
Feral Swine Diseases—Opportunities & Challenges

- Natural Foci
- Zoonotic nature
- Onset of global
- Incidence highly
- Disease complexity

Diagnosis → Treatment → Prevention

Sources control
Regional control
Active surveillance
Early warning
Our goals

• We can do more for feral swine infectious diseases prevention and control

• We can do more for public health safety and biodiversity safety

• We can make a contribute for One World One Health
Welcome to Beijing!

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Thanks For Your Attention

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