



谁主沉浮

Who's the Lord

非洲猪瘟的重要特点和防控实践

ANALYSIS OF ASF INTERNAL CHARACTERISTICS AND THE CONTROL PRACTICE

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内容提要 Content

- **背景流行特点** Background and Characteristics
- **临床案例分析** Clinical case analysis
- **防控策略比较** Prevention and control strategies

背景流行特点

Background and Characteristics

- 牛瘟传至欧洲、非洲，肉牛成片死亡，1905年东非从英格兰引入家猪

The spread of rinderpest to Europe and Africa led to mass mortality of cattle.

European domestic swine was introduced into East Africa from England in 1905.

- 1907年，非洲猪瘟病毒传入家猪首次爆发疫情

African swine fever was first detected in East African in 1907

- 50年代首出非洲：1957年葡萄牙里斯本，1960年葡萄牙、西班牙

1st time: ASF spread to Portugal in 1957 and again in 1959

and from there it spread to Spain in 1960

- 70年代再出非洲，相继传播到巴西、古巴等欧美国家

2nd time: ASF reached the western hemisphere in the 1970s, including Cuba (1971, 1980)

Brazil (1978), the Dominican Republic (1978), and Haiti (1979)

非洲猪瘟演化

Evolution of African swine fever

- 07年三出非洲：2007年再次从非洲传至欧亚交界的格鲁吉亚和俄罗斯

3rd time: ASF entered the Caucasian region and the Russian Federation in 2007

非洲猪瘟新纪元：格鲁吉亚 (2007) “New era” of ASF - Georgia (2007)

- 10年传远东：2012 年乌克兰、俄罗斯，2017 年疫点距满洲里1000 km

The Far East: In 2012, ASF outbreaks have been reported from the Russian Federation and Ukraine. The epidemic focus is 1000 kilometers away from Manchuria in 2017

- 2年传入中国：2018年8月在中国东北发生

In CHINA: ASF outbreaks have been reported in many provinces in China after August, 2018

- 3个月中国爆发65起，扑杀生猪50万头

非洲猪瘟新纪元：格鲁吉亚（2007）

“New era” of ASF - Georgia (2007)

继2007年在格鲁吉亚引入后，非洲猪瘟正在向四面八方蔓延

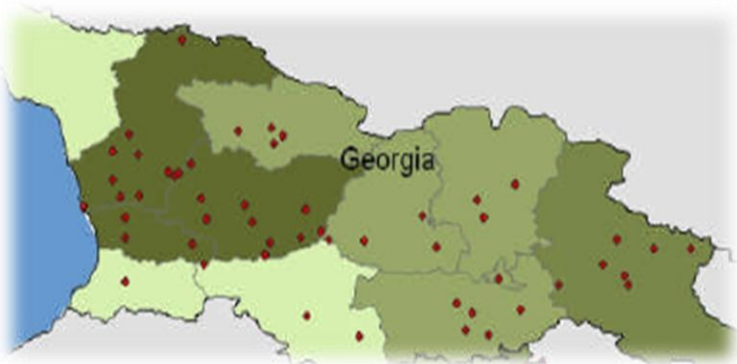
Following the introduction into Georgia in 2007, African swine fever is
spreading in all directions

在国际爆发、全球大流通的新背景下，全球养猪安全备受关注

As the ASF epidemic swept through world, the safety of pig production
is getting much attention

第一起案例发现是消灭本病的最好时机

The first outbreak is the best time to eradicate the disease



- 第一起格鲁吉亚案例2007年6月3日确诊
Diagnosis of ASF in Georgia- 3 June,2007
- 第一时机失去后，非洲猪瘟按天急速扩展
ASF spread rapidly after the best time for eradicate
- 除了扑杀疫点和接触猪，没有别的科学办法
Mass culls of infected pigs and dangerous contacts without other scientific methods
- 散发形势形成后，高加索地区周围陷入恐慌
Sporadic outbreak has sent Caucasus region into a panic

非洲猪瘟必然导致近约100%死亡率

Appear with nearly 100% mortality

- 从俄罗斯、乌克兰、波兰等国，四面八方稳步扩散和无情运动

ASF spread steadily and relentlessly from Russia, Ukraine and Poland to all directions.

- 除了减群和艰难维持，猪场无法从非洲猪瘟中摆脱

In addition to reducing scale and hard maintenance, pig farms can not get rid of African swine fever.

- 阻断传播主要依赖监测和快速报告

Blocking the spread of ASF is mainly dependent on surveillance and rapid detection.

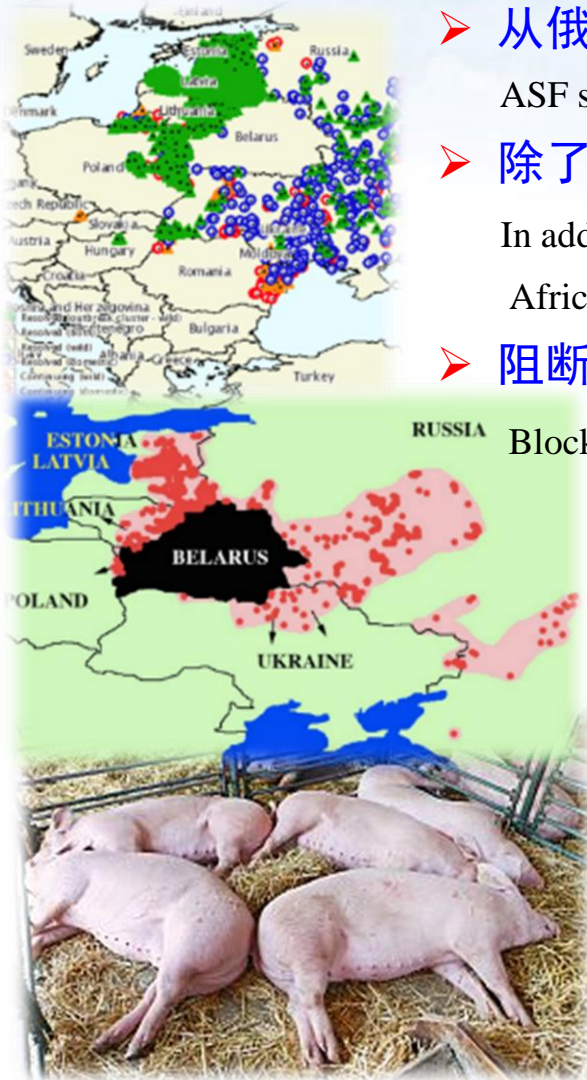
不明疫情或掩盖疫情会导致更大损失

Unknown or cover up epidemic situation will cause more

非洲猪瘟必然导致严重病变和近约100%死亡率

(Willian, 1981, AVSCM)

African swine fever lead to severe disease and nearly 100% mortality (Willian, 1981, AVSCM)



欧洲爆发原因之一

Reasons for the outbreak of ASF in European

野猪作为非洲猪瘟病毒的天然储主，将疾病传播到家养猪场

Wild boars are the main vector of ASFV, ASF spread to domestic pigs by infected wild boars

➤ 高加索地区带毒野猪的运动导致疫情不断扩散

ASF spread to Caucasus region through movements of infected wild boars

➤ 当地的狩猎习惯使野猪带毒废弃物被动转移

Movement of pork products after hunt

➤ 波兰死亡和腐烂的野猪，尸体仍然有感染性

This dead wild boar was still infective



在俄罗斯死于ASF的猪
Pigs dies of ASF in Russia



野猪(死亡和存活)是病毒的主要载体 Wild boar – dead and alive – are the main vector

欧洲爆发原因之二

各国不能合作完成广泛的监测、报告和扑杀，导致疫情扩散

The epidemic due to without close international cooperation and harmonisation of eradication plan



Dr. Linda Dixon

Pirbright 世界动物卫生组织ASF参考实验室

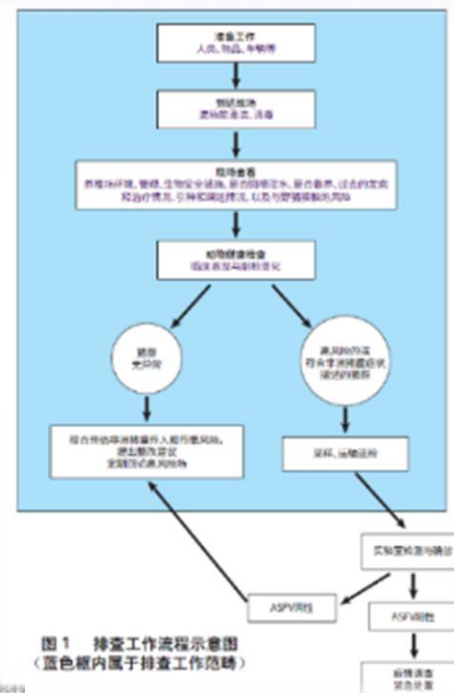
Head of African Swine Fever Virus Group

The OIE reference laboratory for African swine fever

The Pirbright Institute, UK

➤ 非洲猪瘟的快速诊断和彻底监测对于其控制是必不可少的

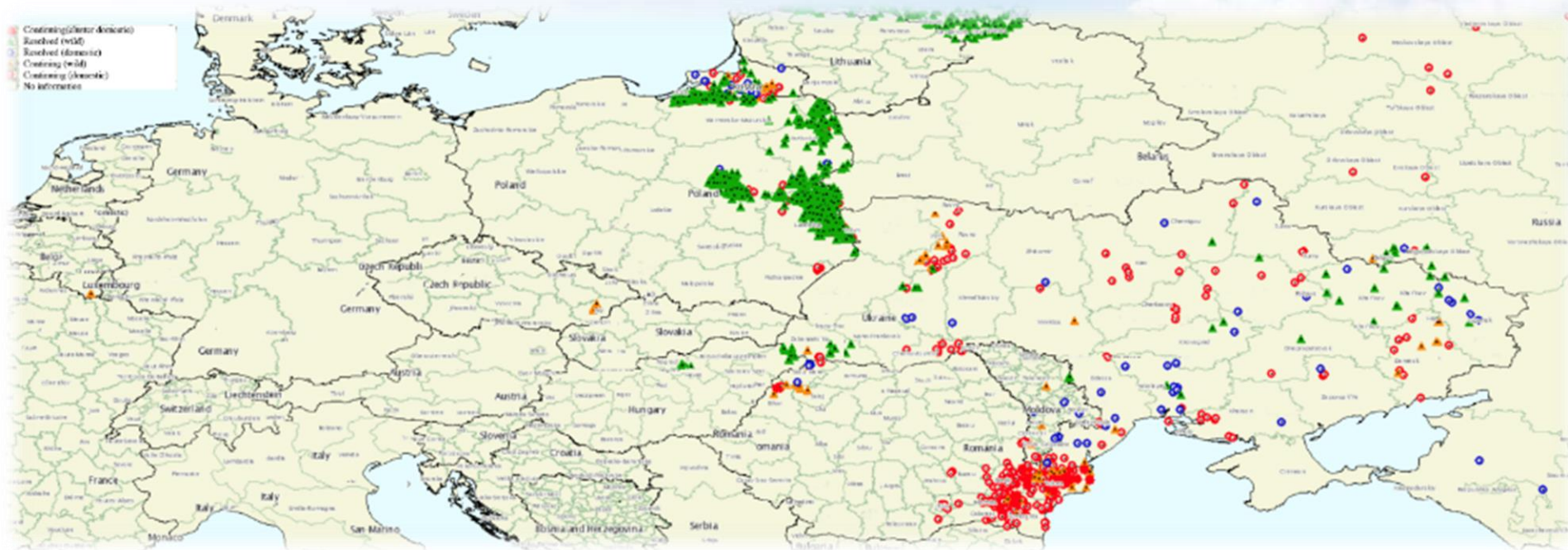
Rapid diagnosis and surveillance of African swine fever is essential for its control



欧洲爆发原因之三

Reasons for the outbreak of ASF in European

横穿欧洲的汽车交通威胁欧洲全境 Drivers across Europe



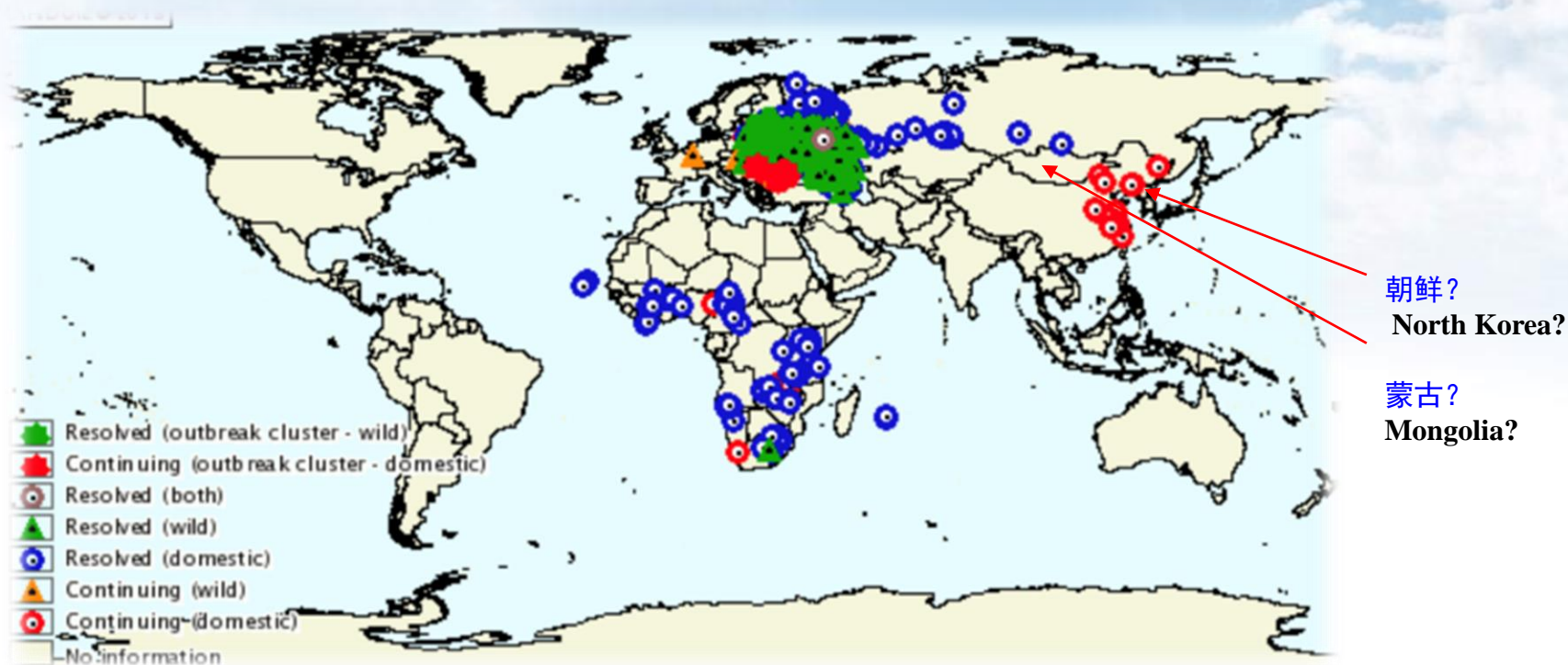
Country	Jan 2018	Feb 2018	Mar 2018	Apr 2018	May 2018	Jun 2018	Jul 2018	Aug 2018	Sep 2018	Oct 2018	Nov 2018	Dec 2018
Romania												
	1	...	1	291	98	176	47

2018迄今，欧洲共接收到 3347 例疫情报告

2018 so far 3347 reported cases in Europe

专家推测：欧亚大陆的大部分养猪国家和地区 **发病只是时间问题**

Speculate: ASF outbreak in most pig farms in Eurasia, **it is just a matter of time !**



- 非洲猪瘟新纪元： **“New era” of ASF**
- 没有疫苗，没有其它科学手段，非洲猪瘟成为养猪人的**难题**
No vaccine and other scientific methods available, ASF has become a conundrum
- **在国际爆发、全球大流通背景下，养猪生产安全如何从长计议**

Under the ASF epidemic swept through world, how to carry out the safety of pig production?

新纪元灾难：非洲猪瘟已经常驻欧洲，我们必须严阵以待

Let's face it: ASF is here to stay in Europe



波兰国家兽医研究所OIE参考实验室负责人Zygmunt Pejsak教授

Professor Zygmunt Pejsak,
director of OIE reference
laboratory for African
swine fever

➤ 进入野猪群的后果：欧洲目前已无法消灭非洲猪瘟

The consequences of wild boars infecting : Europe is no longer able to eradicate African swine fever

➤ 如果亚热带地区传播到蜱虫，会形成新传染源

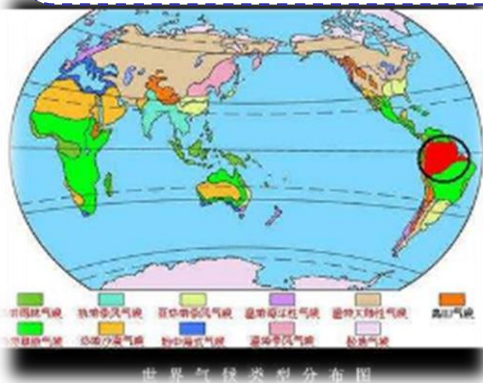
If the African swine fever spreads to the ticks in the subtropics, it will form a new source of transmission

➤ 蜱虫疫源地就会像非洲一样：养猪无望！

The tick epidemic will be like Africa: there is no hope of raising pigs

“如果非洲猪瘟病毒进入蜱虫，我们永远不会摆脱它”

If the African swine fever virus enters into ticks, we will never get rid of it



南非东非大多数蜱虫都感染ASFV，感染率高达25% Most ticks in East Africa are infected with ASFV, with an infection rate of 25%.

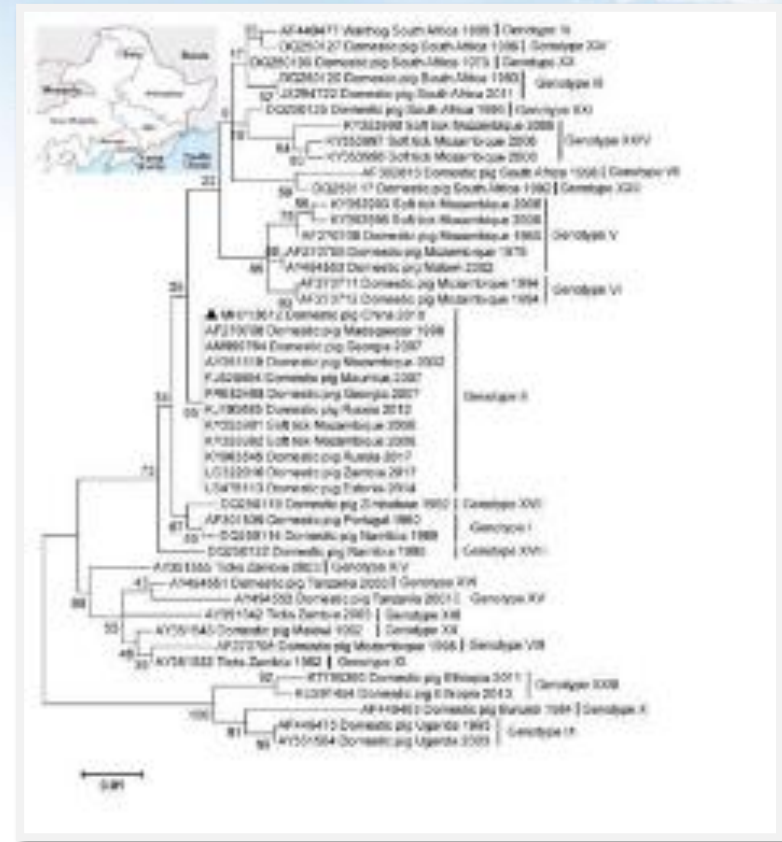
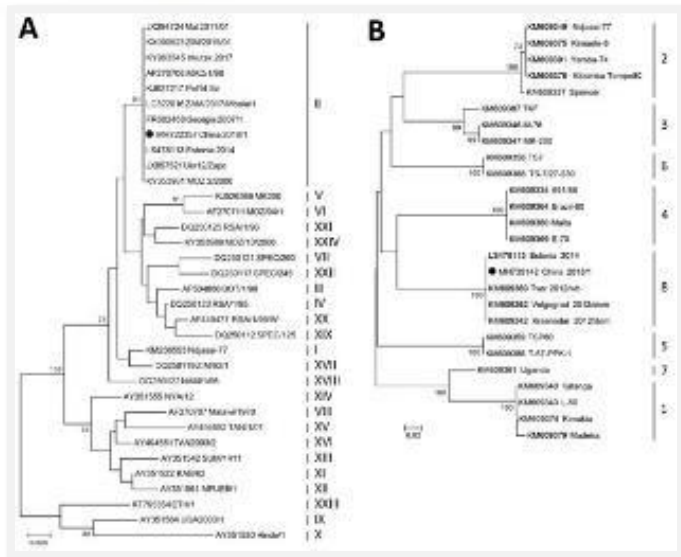
---FENNER兽医病毒学第四版 Veterinary virology, The Fourth Edition

Preliminary Speculation on the Origin of ASF in China

- 来源推测：欧洲东部传染源
- From Eastern Europe
- 范围推测：中国东北、江淮以北的华东华北区域
- Scope: Northeast China and north of Yangtze River in East China and North China
- 传播途径推测：肉类或相关肉质品通过未知途径带入
- Transmission route: pig meat or related products with virus are brought into China in unknown way
- 推测病原进入时间：2018年上半年由东北入境
- Possible time of pathogen entry: entry from Northeast China in the first half year of 2018

Reasons for Speculation

- 来源推测：欧洲东部传染源
- From Eastern Europe
- 我国非洲猪瘟病毒为基因II型
- Our ASF virus is II gene type



Reasons for Speculation

- 高度接触性传染病，病毒可由呼吸道入侵，首先在扁桃体和鼻黏膜附近的淋巴结增殖，而后进入血液，此后全身分泌物均含大量病毒，感染量为每毫升血清或每克组织 10^9ID_{50}
- Highly contagious infectious diseases, the virus can be invaded via the respiratory tract, first in the lymph nodes near the tonsils and nasal mucosa, and then into the blood, after which the systemic secretions contain a large number of viruses, the amount of infection is 10^9ID_{50} per ml of serum or per gram of tissue
- 环境抵抗力较强，在尸体中长期存活，腌制烟熏也不能灭活，跨国传播主要通过未煮熟肉品
- Strong environmental resistance, long-term survival in the body, pickled smoke can not be inactivated, cross-border transmission mainly through uncooked meat

Reasons for Speculation

- 推测病原进入时间：2018年上半年由东北入境
- Possible time of pathogen entry: entry from Northeast China in the first half year of 2018
- 记住非洲猪瘟最重要的传染特征：接触传播、接触传播、接触传播
- Remember the most important infectious characteristics of ASF

Contact Transmission, Contact Transmission, Contact Transmission

这将是未来防控非洲猪瘟的最重要着眼点

- 初期感染性严重程度超乎想象，死亡率高，潜伏期3-15天不等
- In the early stage, the infection severity was beyond imagination. The mortality rate was very high, and the incubation period was 3-15 days.
- 中国发达的全流通物流体系使东北和华中、华南没有距离，大型养猪区域8月前均未发现重大传染死亡事件
- Because of the developed material flow system in China, there is no distance between Northeast China and Central China and South China. No major infectious deaths were found in intensive pig-raising areas before August.

睁大眼睛密切关注六年：很难相信狼真的来了

Keep an eye on it: but we didn't believe the wolf is here

- 中国政府近3年一直睁大眼睛密切关注非洲猪瘟传入动态

The Chinese government has been keeping a close eye on the introduction of African swine fever in the past 3 years.

- 2012 年起，ASF 正式纳入国家动物疫病监测计划

Since 2012, ASF has been officially incorporated into the national animal disease surveillance program.

- 截至2016 年底，累计监测家猪和野猪样品8 万余份，全部均为阴性

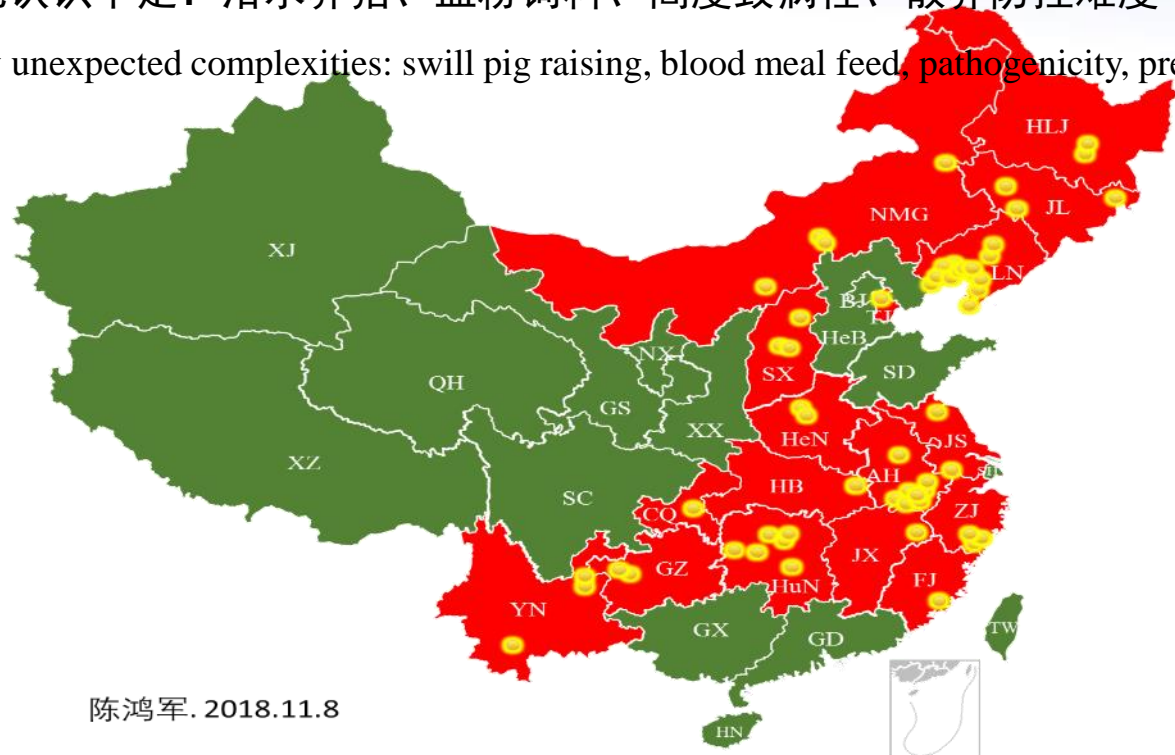
By the end of 2016, more than 8 000 samples of pigs and wild boars had been monitored, all of which were negative.

——Ge Shengqiang, Microbiol. China 2017, Vol.44, No.12

中国加速流行的原因

Causes of accelerated transmission in China

- 发现迟：推测ASF已经在东北流行2-5个月以后才被发现，丧失了最佳扑灭时机
- The discovery is late: Lost the best time to clean up
- 疫情发生后，未能及时阻止疫区病猪的移动
- After the outbreak of the disease, the disease pigs in the epidemic area could not be stopped in time
- 对很多意外的复杂情况认识不足：泔水养猪、血粉饲料、高度致病性、散养防控难度
- Lack of knowledge of many unexpected complexities: swill pig raising, blood meal feed, pathogenicity, prevention and control difficulties



三个重要流行特点1 Three Important Epidemic Characteristics

High lethality and strong meat vitality 致死率高，肉品中生命力强

记住非洲猪瘟最重要的传染特征1：致死率高，肉品中生命力强

Remember the most important infectious characteristics of African swine fever 1

Resilience of ASFV across a variety of environmental conditions	
Item	ASFV survival time
Meat with and without bone and ground meat	105 days
Salted meat	182 days
Cooked meat (minimum of 30 minutes at 70 °C)	0
Dried meat	300 days
Smoked and deboned meat	30 days
Frozen meat	1 000 days
Chilled meat	110 days
Offal	105 days
Skin/Fat (even dried)	300 days
Blood stored at 4 °C	18 months
Faeces at room temperature	11 days
Putrefied blood	15 weeks
Contaminated pig pens	1 month

Source: adapted from Scientific Opinion on African swine fever, *EFSA Journal*, 2010; 8(3):1556.
The times given reflect the known or estimated maximum duration and will depend strongly on environmental temperature and humidity.

警示：肉品、泔水、肉骨粉曾经导致多国爆发疫情

Warning: meat, dawning, meat and bone meal have caused outbreaks in many countries

不可误判非洲猪瘟：致死率高，生命力强

Note: High lethality and strong vitality

- 高度接触性传染病，病毒可由呼吸道入侵，首先在扁桃体和鼻黏膜附近的淋巴结增殖，而后进入血液，此后全身分泌物均含大量病毒，感染量为每毫升血清或每克组织 10^9 ID₅₀
- Highly contagious infectious diseases, the virus can be invaded via the respiratory tract, first in the lymph nodes near the tonsils and nasal mucosa, and then into the blood, after which the systemic secretions contain a large number of viruses, the amount of infection is 10^9 ID₅₀ per ml of serum or per gram of tissue
- 初期感染性严重程度超乎想象，死亡率高，潜伏期3-15天不等
- The initial infectiousness is beyond the imagination, the mortality rate is high, and the incubation period ranges from 3 to 15 days.
- 环境抵抗力较强，在尸体中长期存活，腌制烟熏也不能灭活，跨国传播主要通过未煮熟肉品
- Strong environmental resistance, long-term survival in the body, pickled smoke can not be inactivated, cross-border transmission mainly through uncooked meat

三个重要流行特点2 Three Important Epidemic Characteristics

Contact Transmission: The most important point of control

这将是未来防控非洲猪瘟的最重要着眼点

- 高度接触性传染病
- Highly contagious infectious disease
- 接触传播的流行病学特征
- Epidemiological characteristics of contact transmission
- 生物安全的着眼点为阻断接触传播
- The focus of biosafety is blocking contact transmission

三个重要流行特点3 Three Important Epidemic Characteristics

Remember the most important infectious characteristics of African swine fever 3:

Early detection is the key

疑似疫情，马上报告，同时限制移动，封场消毒

Suspected epidemic, report immediately, restrict movement, Sealing disinfection

- “早”：早发现 早报告 早诊断“Early”
- Early detection, Early report , Early diagnosis
- “快”：快处置
- Fast: Quick disposal
- “严”：严措施，如封锁要严、消毒要严
- Strict: strict measures, such as strict blockade, strict disinfection
- “小”：疫情范围控制到最小，损失降低到最小，影响减少到最小
- Small: the scope of the epidemic is controlled to a minimum, the loss is reduced to a minimum and Minimize the impact

Diagnose and Monitor Pathogens EFSS Elimination Principles have wide applicability

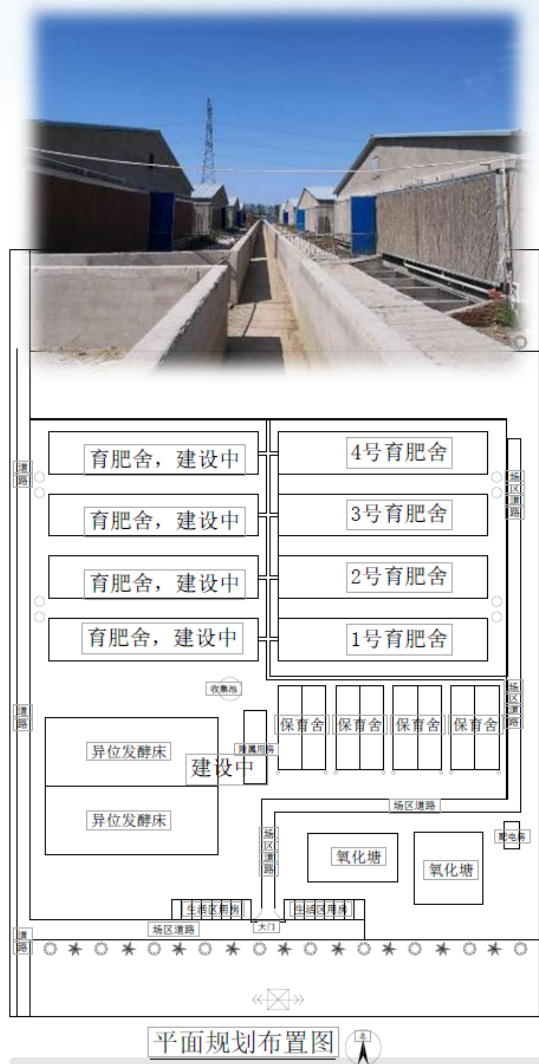
Early clinical diagnosis is of great value

New early pen-side diagnostic techniques should be developed

临床案例分析 Clinical case analysis

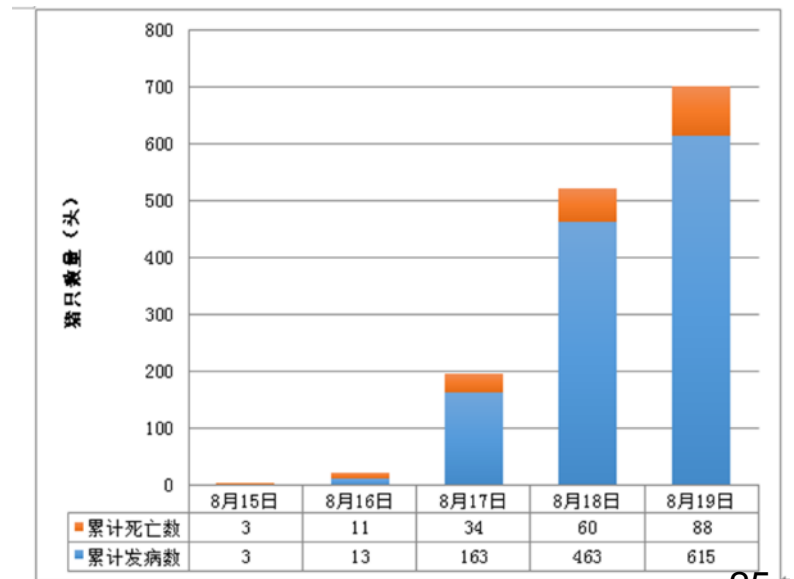
连云港连成牧业疫情 Case of Lianyungang

- 2018年4月建成，有4幢圈舍，5月6日至6月9日先后分8批次从山东调进4753头PIC苗猪
- Four pens were built in April 2018. From May 6th to June 9th, 4753 piglets were transferred from Shandong Province(8 times)
- 5月6日-8月14日，累计死淘生猪18头，主要死因为胀气和胸膜肺炎
- On May 6th to August 14th, 18 dead pigs mainly due to flatulence and pleuropneumonia



发病背景 Background

- 8月15日，2号圈舍生猪开始出现高热，上午发病3头，下午突然死亡
- In August 15th, live pigs began to develop high fever in the 2 house, 3 in the morning and died suddenly in the afternoon
- 至19日18时共发病615头,其中死亡88头
- 18 o'clock on the 19 day, there were 615 cases, of whom 88 died
- 发病率13%，病死率14%
- The morbidity was 13%, the fatality rate was 14%



来源: 陈昌海, 等. 2018.

临床症状 Clinical symptoms

主要表现为发病急、病程短、死亡快

Acute onset, short course and quick death

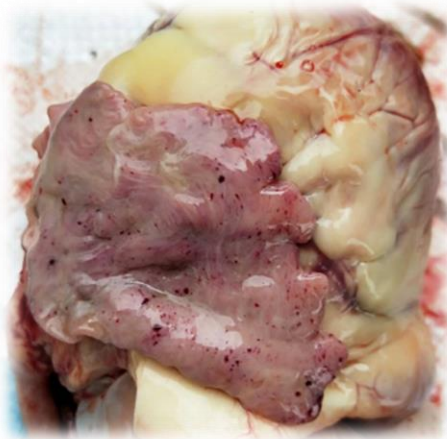
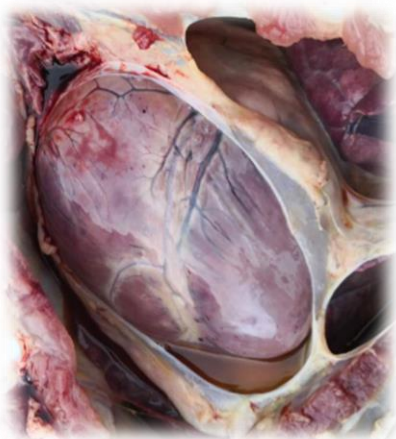
- 发烧 $41-42^{\circ}\text{C}$ Fever $41-42^{\circ}\text{C}$
- 食欲减退 Anorexia、便血 Bloody stool
- 站立不稳、卧地不起、个别抽搐 Unstable standing, lying on the ground, convulsions
- 皮肤黄染、局部皮肤出血 Skin yellow staining and local skin bleeding
- 鼻腔出血、口腔出现泡沫
- Nasal bleeding and oral foam



剖检病变 Necropsy

(1) 心脏 Heart

- 心包积液
- Pericardial effusion
- 心脏的心耳处有大量出血
- There is a lot of bleeding in the auricle
- 心内膜见紫褐色出血斑
- The endocardium sees purple brown hemorrhagic spots



剖检病变 Necropsy

(2) 肺、气管 Lung and trachea

- 支气管有大量淡黄色泡沫样渗出液
- A large amount of yellowish foam like exudate in the bronchi
- 肺水肿 Pulmonary edema



剖检病变 Necropsy

(3) 腹腔 Abdominal cavity

- 腹腔大量红色积液
- Large amount of red effusion in abdominal cavity



剖检病变 Necropsy

(4) 脾脏 Spleen

- 脾脏肿大，大小约为正常脾脏的3-6倍
- The size of the spleen is about 3-6 times the size of the normal spleen
- 呈紫褐色、质地硬 It is purple brown and hard



剖检病变 Necropsy

(5) 胃 Stomach

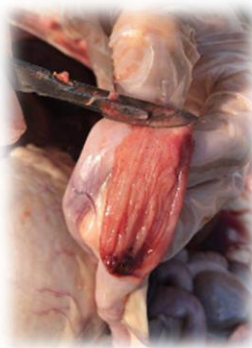
- 胃内过量凝血 Excessive coagulation in the stomach
- 胃基底膜出血 Gastric basement membrane hemorrhage



剖检病变 Necropsy

(6) 肠 Intestines

- 肠浆膜和粘膜出血 Intestinal serosa and mucous membrane bleeding
- 肠内容物呈焦油色 The contents of the intestine are in tar color



剖检病变 Necropsy

(7) 胆囊 Gallbladder

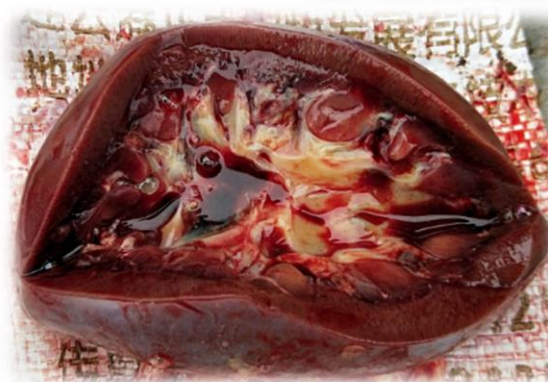
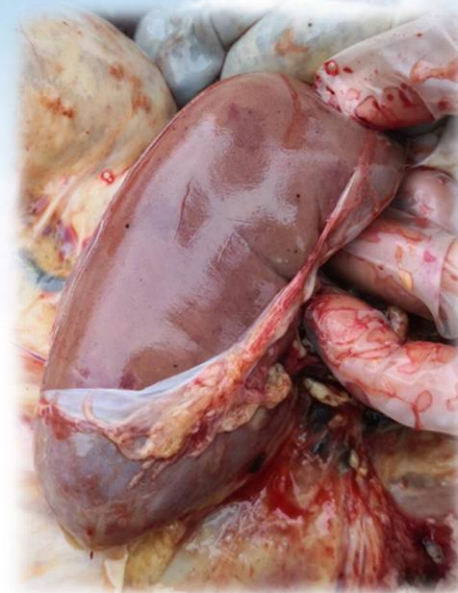
- 胆囊壁出血水肿
- Hemorrhage and edema of gallbladder wall



剖检病变 Necropsy

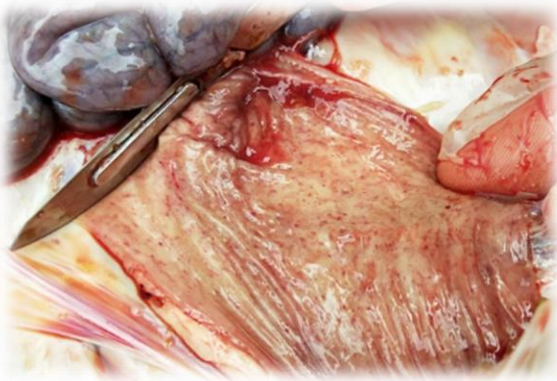
(8) 肾脏 Kidney

- 肾脏表面瘀斑出血
- Hemorrhage of renal surface ecchymosis
- 肾乳头部肿大出血，见淡黄色胶冻样渗出
- Massive hemorrhage in the renal papilla
pale yellow and jelly like exudation.



剖检病变 Necropsy

(9) 膀胱内膜出血 Endocardial hemorrhage



剖检病变 Necropsy

(10) 淋巴结 Lymph gland

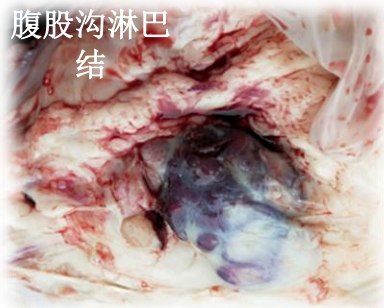
- 淋巴结肿大、出血、形态类似于血块
- Swollen, bleeding and morphologically similar to blood clots
- 淋巴结切面潮红，指压时有血液渗出 Flushed with blood exudation



下颌淋巴结



胃淋巴结



腹股沟淋巴结



肠系膜淋巴



实验室确诊 Laboratory diagnosis

- 采集发病及病死猪抗凝血10份、脾脏3份、淋巴结3份、肾脏3份以及肺脏等样品，猪组织样品3头份（脾、淋巴结、肾、心和肺等）和全血样品13份，经中国动物卫生与流行病学中心荧光定量PCR检测，结果均为非洲猪瘟病毒阳性
- China's animal health and Epidemiology Center detected positive by fluorescence quantitative PCR
- 非洲猪瘟病毒p72、p30、p54、CVR、CD2v、TRS基因序列片段进行扩增、测序、比对，发现江苏连云港毒株序列与辽宁沈阳、河南郑州毒株序列相似性为100%，均属于非洲猪瘟病毒基因II型，与来自俄罗斯、爱沙尼亚、格鲁吉亚、波兰等国的毒株遗传进化关系最近，与Estonia 2014、Georgia 2007毒株形成一个较为独立的进化小分支
- The Jiangsu Lianyungang strain belongs to the African swine fever virus gene type II

连云港案例：临床三个早期症状

Case of Lianyungang : three early clinical symptoms

- 皮肤黄染
- Jaundice
- 鼻腔流白色泡沫或带血
- Flow of white foam or with some blood from nasal
- 便血
- Blood in the stool



连云港案例：其它早期症状

Case of Lianyungang :Other early symptoms

- 肛表测试温度41-42℃、猪群杂堆、抗生素治疗不见效
- Very high temperatures 41-42 °C (Anal test), huddled together , antibiotic treatment are not effective
- 病猪呼吸困难，侧卧，腹式呼吸
- Sick pigs have difficulty breathing, side lying, abdominal breathing
- 肥猪有急性死亡，死前有划水样神经症状
- Acute death of fat pigs and have neurological symptoms before death

成群大猪突然死亡
Group of big pigs suddenly died



剖检三“大”典型病变

Three "large" typical lesions about anatomy

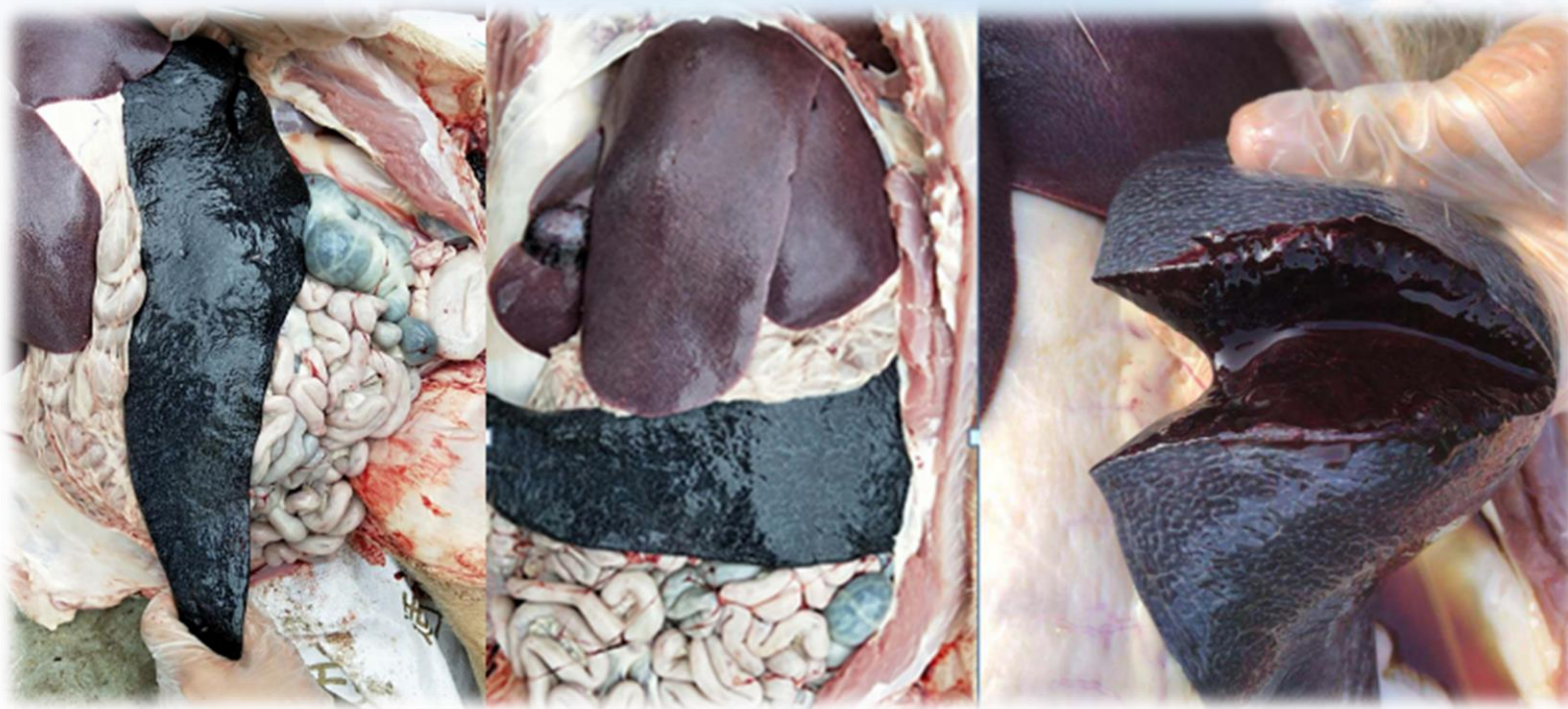
- 大猪死亡；大脾；大出血
- The death of finished pigs, splenomegaly, massive hemorrhage



肠淋巴结出血肿胀如紫葡萄

Intestinal lymph node hemorrhage, such as purple grapes

脾脏肿大3-6倍以上是非洲猪瘟的鉴别诊断典型特征
Over 3-6 times splenomegaly is a typical feature of differential diagnosis of ASF



脾脏肿大可达正常脾脏的3-6倍以上，呈暗红色或黑色，质地硬
The very dark red or dark and enlarged spleen (over 3-6times) , Hard texture

扑杀、封锁、解除封锁



防控策略比较 Prevention and control strategies

- 欧洲方法 European methods
- PIC方法 PIC method
- 中国实践 Practice in China

约翰·卡尔的欧洲疫区实战经验

John: Carle's experience in European epidemic area

- 卡尔博士为北美洲、欧洲、亚洲、澳洲和非洲多国进行猪场临床咨询和政府顾问

Dr. Carl is a clinical and government consultant for pig farms in North America, Europe, Asia, Australia and Africa.

- 曾进入东非、远东ASF疫区

Had entered the ASF epidemic area in East Africa and Far East

- 每天通过WAHIS监视全球ASF动态

Monitoring global ASF dynamics every day through WAHIS

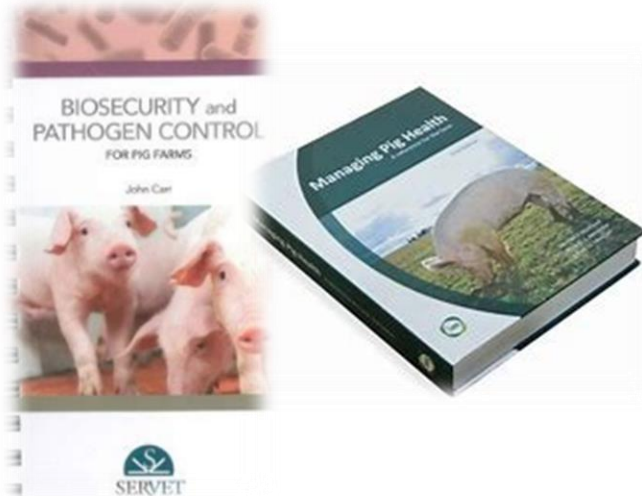
- Publishing monographs 《Managing Pig Health》 2016, 《Pig Health》 2018

John Carr寄语中国大型猪场:

建立三道防线可以阻断非洲猪瘟

John Carr sends a message to China's large pig farms:

The establishment of three lines of defense can stop African swine fever



卡尔纠正专业人员的麻痹认识：这不是活猪，散养没有活猪！

Carle corrected the paralysis of professionals:

This is not a live pig, there is no live pig if raise in free range!

非洲猪瘟必然导致严重病变和近约100%死亡率

(Willian, 1981, AVSCM) ASF will lead to severe disease and nearly 100% mortality.

“我不同意的第一件事：这不是活猪，它是死猪，庭院散养没有活猪！”

——卡尔博士用这样的方式纠正专业人员和公众对非洲猪瘟的麻痹大意的认识

"I do not agree with the first thing, this is not a live pig, it is a dead pig, there is no live pig in the yard!"

- Dr. Carle corrected the carelessness of the professionals and the public about African swine fever in this way.



➤ 所有的散养猪（Backyard breeding）难逃厄运，无论几头或几十万头

All Backyard breeding can't escape from bad luck, no matter how many or hundreds of thousands of pigs

➤ 非洲猪瘟强毒感染性极高，死亡率几乎100%，传播速度不快，常常让专业人员轻视它的凶残真相

The highly virulent ASFV has a mortality rate of almost 100%. It spreads slowly, often making professionals Despise its ferocious truth.

卡尔博士介绍欧洲大型猪场成功经验：
建立三道防线可以阻断外源病毒入侵猪场

Dr. Carle introduces the successful experience of large scale pig farms in Europe:
The establishment of three lines of defense can prevent the invasion of pig farms by exogenous viruses



守住这三道防线
即便像东欧那样的散发背景，大猪场也极少中枪！
Keep these three lines of defense. Even with the sporadic background of Eastern Europe, big pig farms are rarely infected.

阻断非洲猪瘟的第一道防线：围墙

The first line of defense against African swine fever: the fence

➤ 欧洲控制非洲猪瘟的最简单方法：围墙阻止野猪

The simplest way to control African swine fever in Europe: fence to stop wild boars

➤ 什么样的围墙、围栏能构成可靠防线？

What kind of fence and fence can constitute a reliable defense line?

500米500 meters

➤ 是否有SOP确保第一道防线？

Is there a SOP to ensure the first line of defense?



污染肉品和泔水

Contaminated meat and swill

- 猪肉制品并不是煮熟的，而是通过腌制或烟熏制作的，在这些产品中，非洲猪瘟会持续存活数月

African Swine fever virus can survive in the bacon for several months, because these meat product not cooked in the working process

- 食品中ASFV的移动是猪场周围病毒传播的主要来源

African Swine fever virus spread amongst the pigs through the meat product

- 目前北半球的灾难始于对来自非洲轮船食物残羹的不当处理，进而感染了格鲁吉亚的猪群

At present, the northern hemisphere disaster began on the improper handling of ship food scraps from Africa, and then infected pigs in Georgia

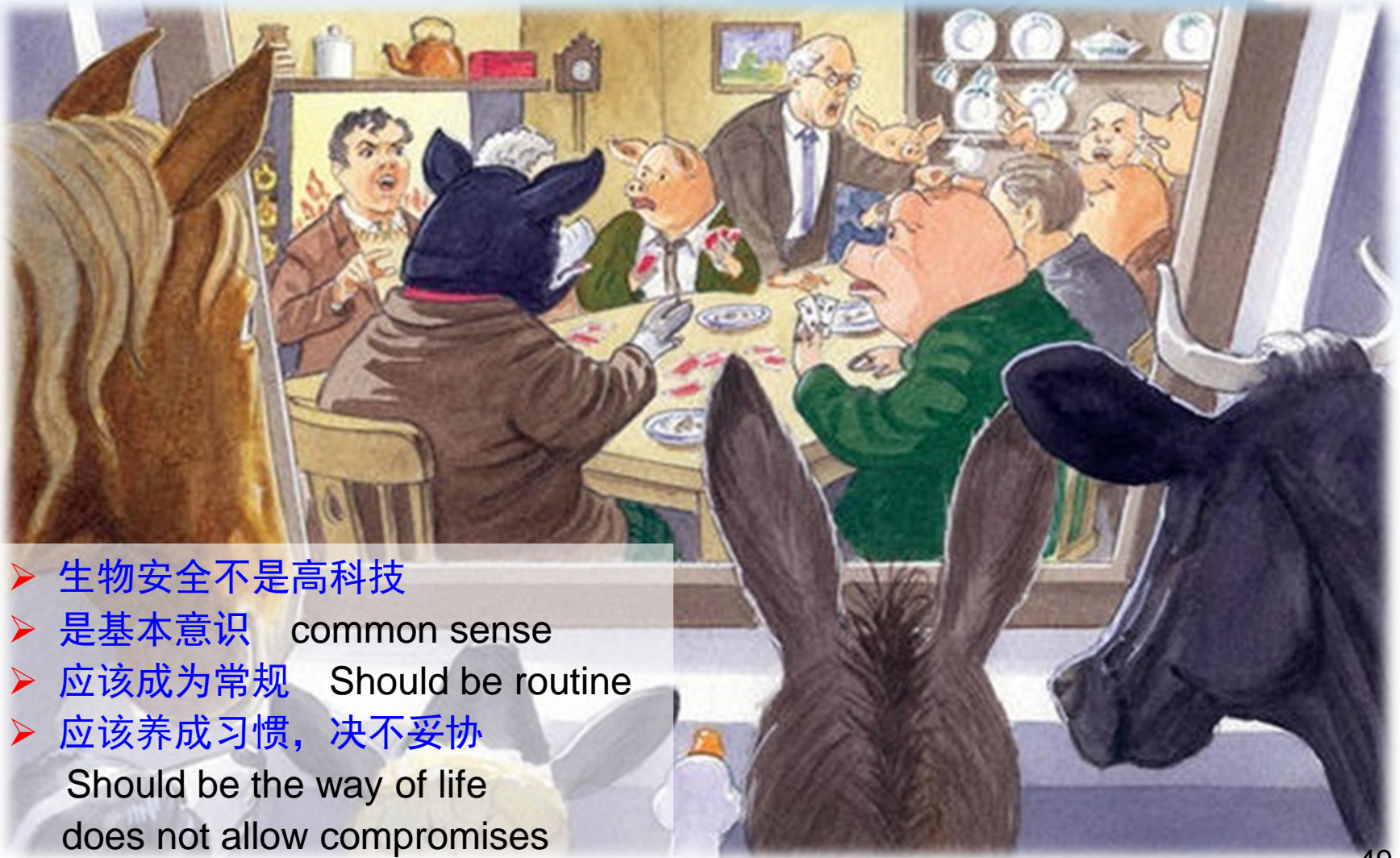


中国五星级酒店早餐现场拍摄，猪肉常不煮熟

filmed on the breakfast spot in The fivestar hotel in China , and the pork is often not cooked thoroughly

意识屏障第三：耳朵中间——永远记得有一道生物安全墙

“between the ears”



- 生物安全不是高科技
- 是基本意识 common sense
- 应该成为常规 Should be routine
- 应该养成习惯，决不妥协
Should be the way of life
does not allow compromises

PIC 猪场生物安全评估手段：千点评分软件

PIC pig farm biosafety thousand point scoring software

➤ LOCATION DESIGN FOOD BREED VEHICLE PEOPLE

生物安全

- 农场场址选择：选择大于努力
- 农场布局设计：好的设计便于管理
- 饲料生物安全：饲料的生产和运输
- 后备种猪引进：隔离和驯化是重点
- 车辆运输管理：重点监控
- 人员执行监督：不断评估



PIC 千点评分软件举例：选址

Biosafety thousand point scoring software: location



1000 Point Scoring Assessment for farm = 'BX2 PN herd, 6232'
BX2 PN herd

SITE LOCATION SUMMARY - SUITABILITY FOR INTENDED FARM USE

assessed by Liang chigang
at 17-Apr-2012

千点评分系统

No	Section	Points	GIU GTC	SLN DLN	Gilt Multiplier	Growout Nursery
1	Number of pigs nearby *)	100.0	Failed	Failed	Failed	Passed
2	Local Pig density *)	150.0	Passed	Passed	Passed	Passed
3	Regional Pig density *)	100.0	Passed	Passed	Passed	Passed
4	Size of farm being assessed	35.0	Failed	Failed	Passed	Passed
5	Number of pig farms < 5 km / 3 miles	40.0	Passed	Passed	Passed	Passed
6	Worst scoring pig farm in area	0.0	Failed	Failed	Failed	Failed
7	Other sources of possible contamination *)	100.0	Passed	Passed	Passed	Passed
8	Type of Terrain	90.0	Passed	Passed	Passed	Passed
9	Type of Roads	75.0	Passed	Passed	Passed	Passed
10	Other animals	50.0	Passed	Passed	Passed	Passed
11	Climate	12.5	Failed	Failed	Failed	Failed
12	Passed Minimum Required TOTAL:	752.5	Failed	Failed	Passed	Passed



大疫防控的中国经验：请教蔡先生

Professor Cai: China's experience in prevention and control of major diseases



让我们听一听，我国动物传染病学家
蔡宝祥先生的五点提炼

Let's listen to the five-point refinement of Mr. Baoxiang
Cai, an animal infectious disease scientist in China

- 蔡先生上世纪四十年代、五十年代到大西北参加牛瘟扑灭

Mr. Cai participated in the eradication of rinderpest in the northwestern from 1940s to 1950s

- 六十年代、七十年代直接参加扑灭口蹄疫、控制猪瘟

Directly participated in the elimination of FMD and control of CSFV in the 1960s and 1970s

- 八十年代后研究鸡瘟等烈性传染病防控技术和产品

After the 1980s, research on prevention and control technologies and products for some severe infectious diseases such as NDV

非洲猪瘟目前在我国的发生仍处于流行初期，还不是爆发流行，散在发生，仍处于扑灭的最佳时机，不必草木皆兵，惊慌失措。

要尽快弄清各疫点的传染来源，仍应贯彻早、快、严、小的原则，控制疫情发展。

国家实施合理赔偿措施，影响措施成败。

建议国家至少数有P3条件的实验室加快疫苗研究。

相信在党的坚强领导下，依靠科技，依靠群众，应能克服万难，将该病消灭。

蔡宝祥

2018.9.5

Prof. Cai: How to eliminate ASF in China

- 非洲猪瘟目前在我国的发生仍处于流行初期，还不是爆发流行，散在发生，仍处于扑灭的最佳时机，不必草木皆兵，惊慌失措
- At present, the occurrence of ASF in China is still in the early stage of epidemic
Not outbreak, still in the best time to put out
- 要尽快弄清各疫点的传染来源，仍应贯彻早、快、严、小的原则，控制疫情发展
- Find out the source of virus and epidemic points situation as soon as possible,
the principle to control : Early, Fast, Strict and Small
- 国家实施的合理赔偿措施，影响措施成败
- The reasonable compensation measures implemented by the state
- 加快疫苗研究
- Speed up vaccine research
- 在国家坚强领导下，依靠科技，依靠群众，应能克服万难，将该病消灭
- We believe that under the firm leadership of the country, relying on science and technology and the masses, we should overcome all difficulties and eliminate the disease

Eliminate ASF, the conditions are much better as a whole

- 牛瘟有很高效的疫苗，而非洲猪瘟没有
- Rinderpest has a highly effective vaccine, while ASF does not
- 牛在牧区很分散形成天然隔离，而猪场规模巨大
- Cattle dispersed in the grazing areas to form natural isolation, while pig farms are large in scale
- 牛瘟康复后体内不带毒，非洲猪瘟有潜伏性感染
- There is no virus in the body after rehabilitation of rinderpest, but ASF has latent infection
- 国家强有力的领导和组织起了关键作用
- The strong leadership and organization of the state played a key role

Eradication of ASF, international successful experience: Determine pathogen infection, and EFSS Principles

- 分区域进行抗原、抗体检测，确定病毒的感染范围
- Detection of antigen and antibody in subarea to determine the scope of infection

- 快速、果断消灭疫点
- Eradication of epidemic focus quickly and decisively

- 消灭疫点的早、快、严、小原则
- The principles of early, fast, strict and small (EFSS Principles)

核心种猪场高标准生物安全体系如何建立？

How to establish a high standard biosafety system for breeding pig farm?

改变
养殖模式

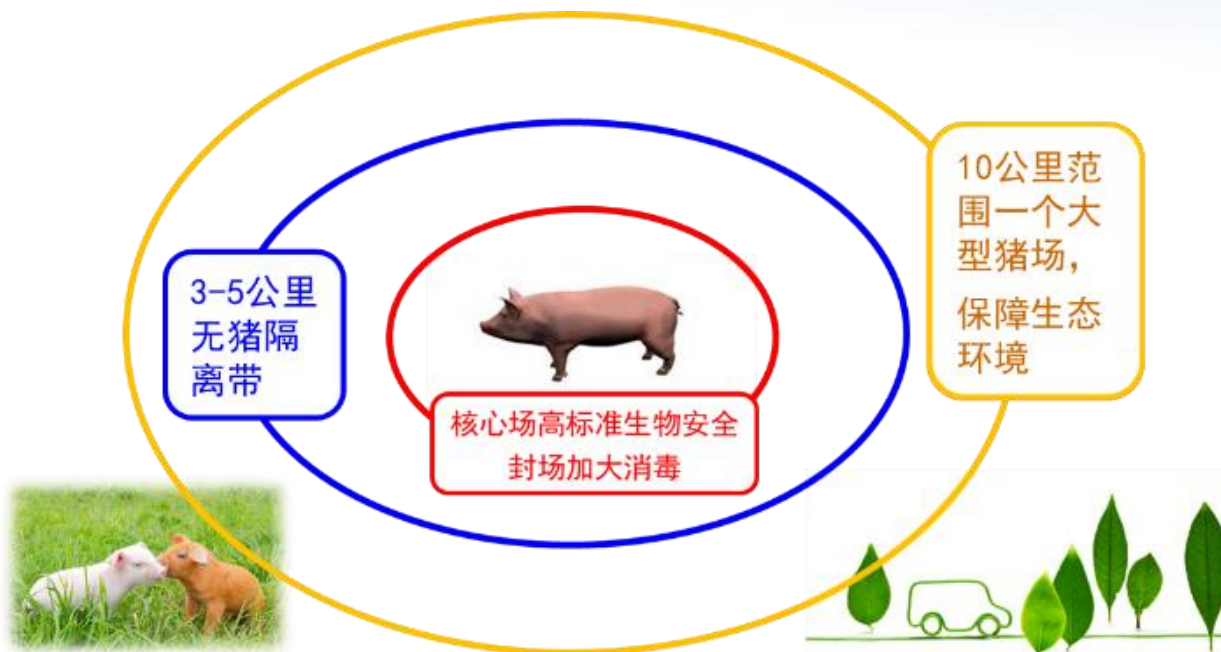


change
breeding
model

建议政府实施养猪牌照制，尽快取缔散养猪场，
保障国家工业化养猪生产安全

It is suggested that the government should implement the license system of pig raising, ban the backyard pig farms as soon as possible, and ensure the safety of national industrialized pig production.

- 无猪保护区域
- Protection zone without other pig farms
- 半径3-5 km
- 3-5 km radius
- 监测区
- Surveillance zone
- 半径10 km
- 10 km radius



Highlight: Remember the most important factors about ASF

消灭非洲猪瘟的三个特征：

1. High lethality and strong meat vitality

2. Contact Transmission

3. Early diagnose is key

Elimination Principles: Early, Fast, Strict, Small

做好心理准备，一切皆有可能

Prepared , Anything is possible

- 非洲猪瘟流行的国际化是一个新的开始
- THE INTERNATIONALIZATION OF ASF IS A NEW BEGINNING
- 政府发力和国际协作一定能扼制疫情发展
- The government, OIE and international help is powerful
- 需要大型养猪企业各自主动发挥创造性作用
- Pig companies could play their creative role
- 需要广大科技人员和人民群众的积极投入
有助于加快净化进程
- All peoples and scientists are needed to join in

非洲猪瘟是可以控制的

African swine fever can be controlled

Thanks To

01



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01

03

04

Thanks To

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- John Carr、Mark Howells、牟小东



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猪支原体肺炎学术团队

支原体网

Mycoplasma

<http://www.piginfo.com>