

# AFRICAN SWINE FEVER IN VIETNAM

Regional Workshop on Swine Disease Diagnosis

Beijing, P. R. China, 30 – 31 Oct 2019



**WORLD ORGANISATION FOR ANIMAL HEALTH**

*Protecting animals, preserving our future*

# Outline



Brief of pig production

ASF Situation

ASF Diagnosis

Prevention and control activities

# Pig production

❖ Pig population in 2019: > **30 million**

Pork volume: 3.82 million tons

Pork presents at 70% meals of Vietnamesees

❖ Pig raising households

- 49% of total pig population
- 40% of total pork volume

❖ Large big farms

- 51% of total pig population
- 60% of total pork volume

❖ Breeding pigs:

- Sow: 3.8 million
- Boar: 76,000

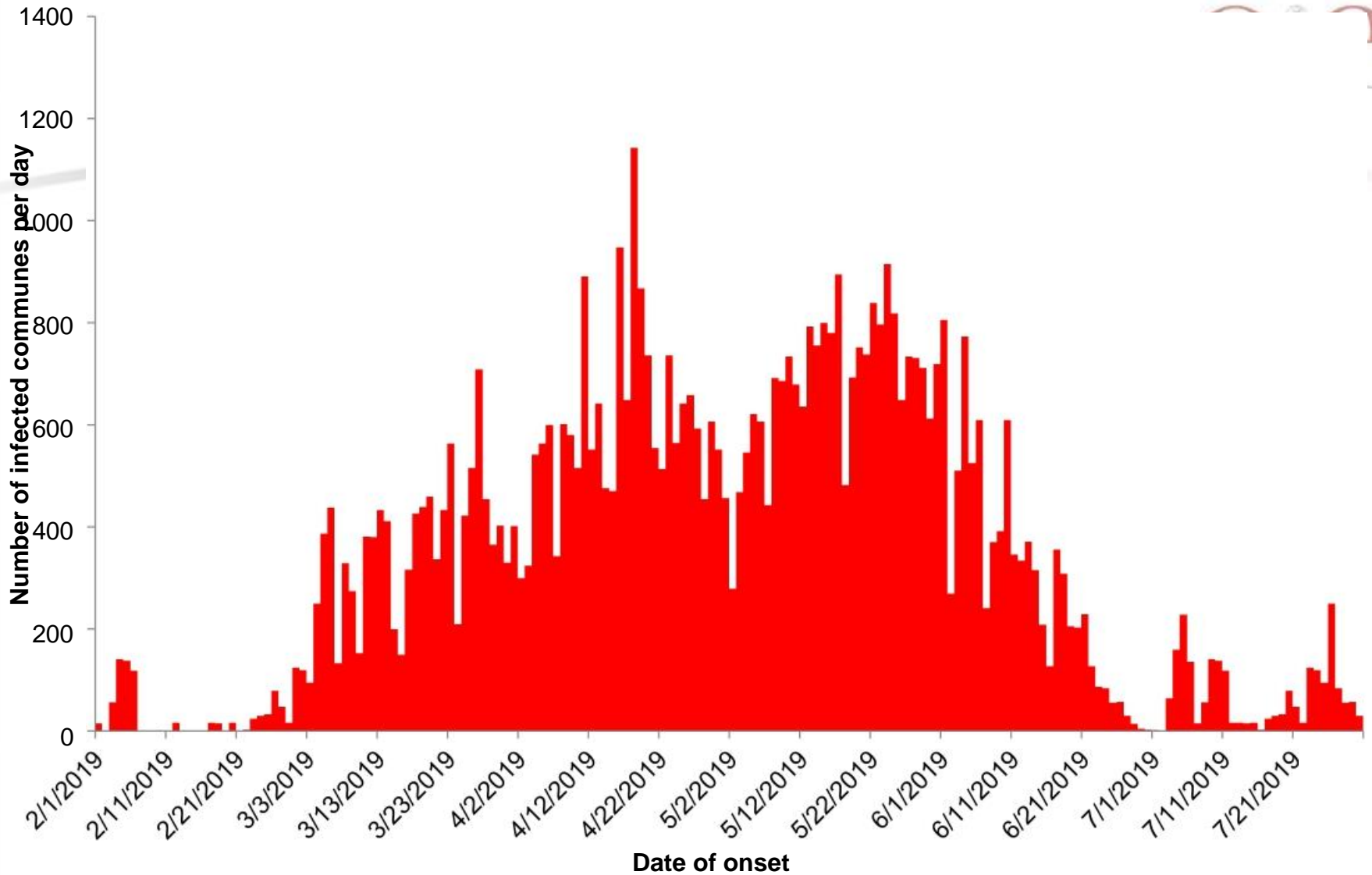


# **SITUATION OF AFRICAN SWINE FEVER IN VIETNAM**

# First detection of ASF in Vietnam



- On 01 Feb 2019, a pig raising household in Hung Yen province reported sick pigs with high fever and death pigs, DAH staff visited immediately and took samples that were then tested at four laboratories using different testing protocols (OIE, USDA, AAHL) with various primer sets and probes. *Conclusion of ASF positive.*
- Culled all 33 pigs of that household in late afternoon of 01 Feb 2019 and application of control measures
- DAH did sequencing the PCR products at two laboratories with confirmation of ASF detection



**Temporal distribution of ASF outbreaks in Vietnam between Feb and August 2019**

# Updated on ASF

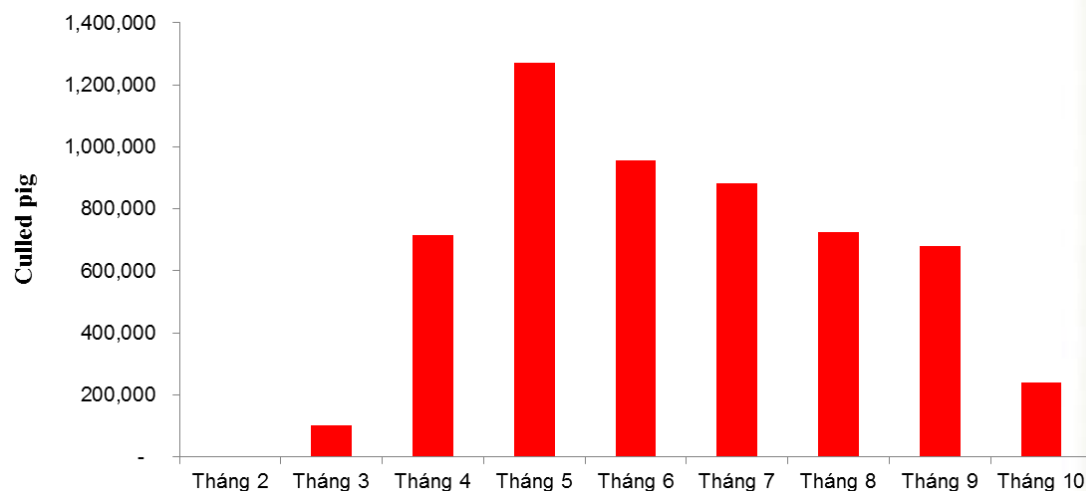
From 02/ - 10/2019

**620** districts

**63** provinces.

**5.6** million culled pigs

≈ 8,3% pork volume



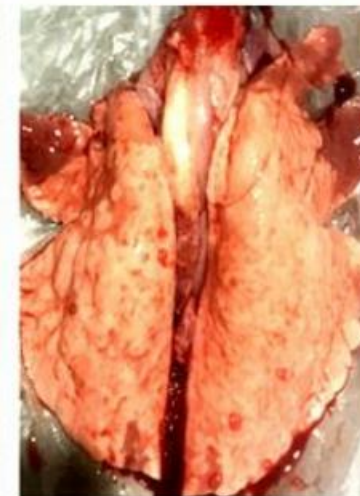
## CLINICAL SYMPTOM



- ❖ Clinical signs were first observed in sows (pregnant sow) and then fattening pigs later in piglets
- ❖ Mortality in sow = suspect ASF
- ❖ Infection spreading within the infected farm is slow



# CLINICAL SYMPTOM AND NECROPSY LESIONS



# DIAGNOSIS

# ASF Diagnosis



- **Virus detection**

**Real time PCR – OIE (King et al 2003), (*FERNÁNDEZ-PINERO et al 2013*)**

**Virus isolation: PAM Cell culture**

- **Antibody detection**

**ELISA**

***IPT (Indirect Immunoperoxidase Test )***

- **PT**

**Participated PT panels organised by AAHL/ FAO  
Inter-laboratory comparison**

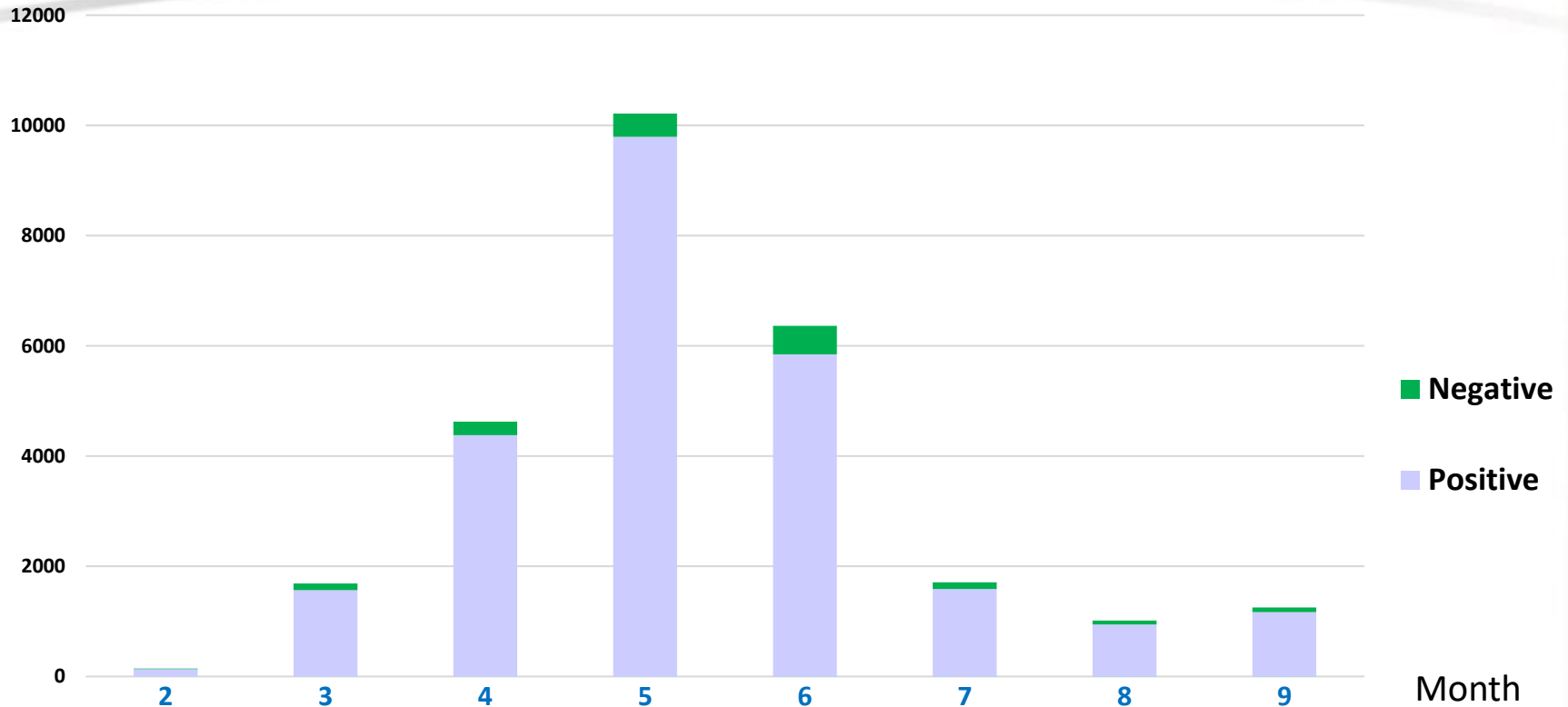
# ASF virus tissue tropism study

No.	Organs	Level of ASF viral DNA in organ by Ct value							
		Pig No.1 (7wks old, dead)				Pig No.2 (7wks old, sick and killed)			
		1	2	3	Mean	1	2	3	Mean
1	Heart	20.65	20.38	20.82	<b>20.6</b>	19.89	20.45	20.51	<b>20.3</b>
2	Lung	17.59	18.01	17.89	<b>17.8</b>	16.52	16.83	16.24	<b>16.5</b>
3	Liver	15.93	15.83	15.22	<b>15.7</b>	17.10	16.55	16.29	<b>16.6</b>
4	Kidney	20.82	21.23	21.19	<b>21.1</b>	19.83	20.02	20.98	<b>20.3</b>
5	Muscle	24.22	23.62	23.91	<b>23.9</b>	23.73	23.09	23.20	<b>23.3</b>
6	Tonsil	15.39	15.82	15.69	<b>15.6</b>	18.78	19.41	19.38	<b>19.2</b>
7	Spleen	13.98	14.48	14.72	<b>14.4</b>	15.95	15.62	15.33	<b>15.6</b>
8	Lymph node (mesenteric)	16.55	17.04	16.99	<b>16.9</b>	18.19	19.24	18.73	<b>18.7</b>
9	Lymph node (mandibular)	17.30	17.29	16.89	<b>17.2</b>	18.50	18.21	18.72	<b>18.5</b>
10	Lymph node (inguinal)	16.92	16.60	17.12	<b>16.9</b>	18.59	18.64	18.70	<b>18.6</b>
11	Blood (serum)	NA	NA	NA	<b>NA</b>	18.50	19.23	18.79	<b>18.8</b>

**Take inguinal  
lymph node  
Blood sample**



# ASFV detected by qPCR in NCVD



- All sera and tissue samples collected from infected pigs are strong positive Ct=12 – 24
- Positive samples: from 91 to 95 %

# ASFV isolation



**PAM**  
**cell**

**HAD**  
**(+)**

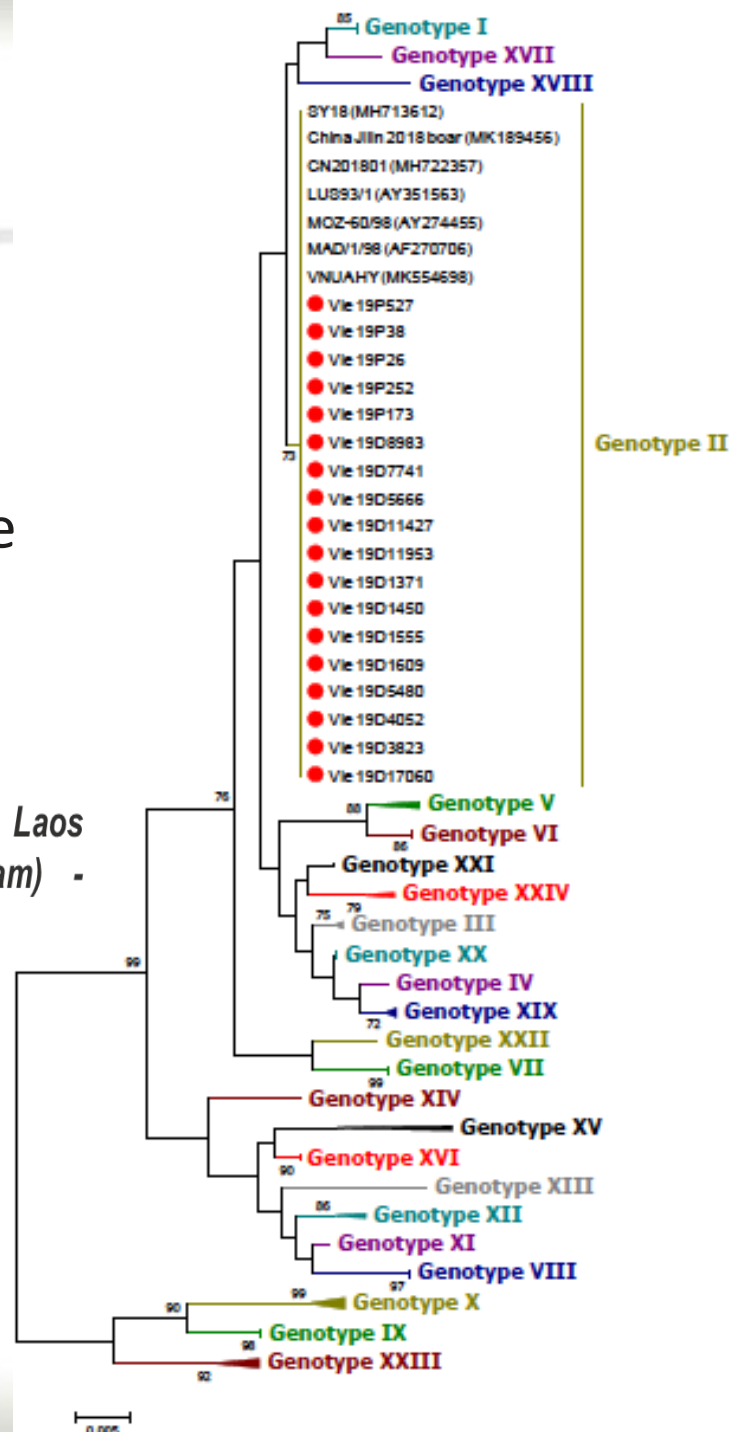
# GENETIC ANALYSIS GENOTYPE

❖ *Samples from 18 provinces*

NJ tree based on the p72 gene DNA in NCVD samples belong to **ASFV Genotype II**.

❖ *IAEA Emergency ASF Support to MS - (Cambodia; Laos PDR; Mongolia; Thailand; Myanmar and Vietnam) - GENOTYPING BY SEQUENCING*

- Vietnamese ASFV strains

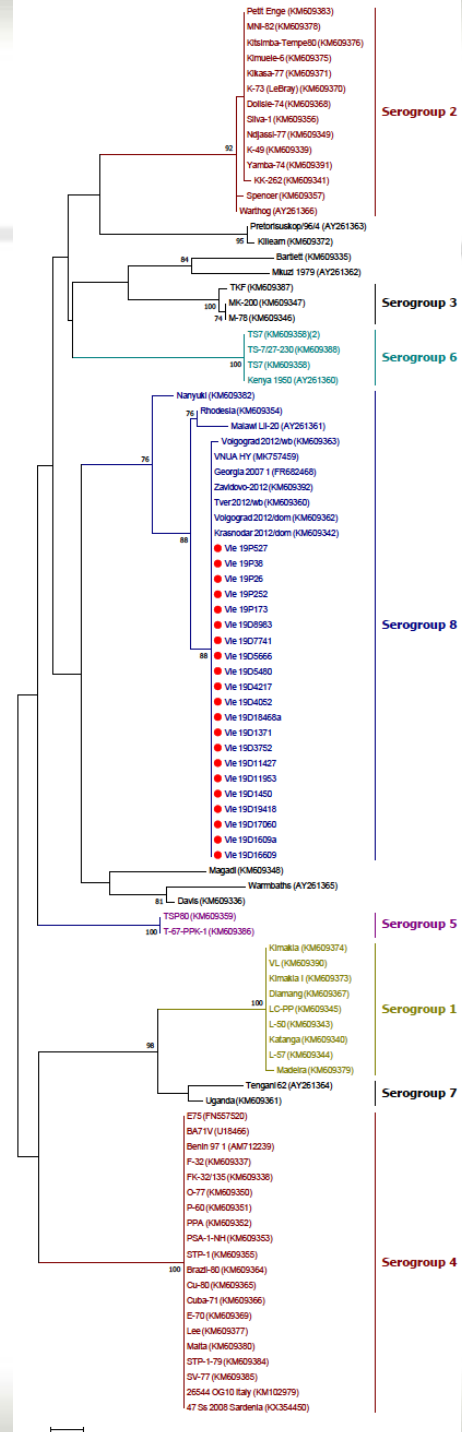




# GENETIC ANALYSIS SEROGROUP

ML tree using the partial amino acid sequences of the CD2v protein to determine the serogroup of the ASFVs in the samples → all belong to **serogroup 8**.

- Vietnamese ASFV strains



# CVR profile analysis



Sample	CVR
Vie_19P527	BNDBNDBNAA
Vie_19P38	BNDBNDBNAA
Vie_19P26	BNDBNDBNAA
Vie_19P252	BNDBNDBNAA
Vie_19P173	BNDBNDBNAA
Vie_19D7741	BNDBNDBNAA
Vie_19D11427	BNDBNDBNAA
Vie_19D11953	BNDBNDBNAA
Vie_19D1371	BNDBNDBNAA
Vie_19D1450	BNDBNDBNAA
Vie_19D1555	BNDBNDBNAA
Vie_19D1609	BNDBNDBNAA
Vie_19D16609	BNDBNDBNAA
Vie_19D17060	BNDBNDBNAA
Vie_19D5666	BNDBNDBNAA
Vie_19D5480	BNDBNDBNAA
Vie_19D4217	BNDBNDBNAA
Vie_19D4052	BNDBNDBNAA
Vie_19D18468	BNDBNDBNAA
Vie_19D19418	BNDBNDBNAA
Vie_19D3752	BNDBNDBNAA
Vie_19D3823	BNDBNDBNAA

To further look for possible variants, the CVR profile analyzed, by matching the amino acid tetramers of the pB602L of NCVD sample with previously reported, only one pattern in all samples: BNDBNDBNAA



# Antibody detection in infected pigs



Kit ELISA INgezim PPA COMPAC 11.PPA.K.3



No. Sample	qPCR	ELISA (+)	% ELISA (+)
291	ASF virus (+)	12	<b>4,1%</b>
67	ASF virus (-)	0	0%

qPCR - OIE (King et al 2003)

# Antibody detection in healthy pigs

Kit ELISA INgezim PPA COMPAC 11.PPA.K.3

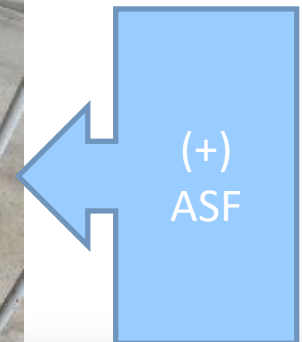
No. Sample	qPCR	ELISA (+)	% ELISA (+)
466	ASF virus (-)	0	0%

# Antibody detection in old outbreak



Place	Sample type	Number	qPCR	ELISA (+)	%
Thái Bình	Serum	124	(-)	24	19,4%
Nam Định	Serum	55	(-)	4	7,3%

Select 2 pigs have strong positive, take saliva to test for ASF virus by qPCR: 1/2 (+) ASF



# PREVENTION AND CONTROL ACTIVITIES

# Before the first detection of ASF in Vietnam



- On 30 August 2018, Minister of MARD sent Urgent telegraph to request all relevant ministries and provinces to implement all necessary actions for preventing ASF coming to Vietnam
- On 12 September 2018, Prime Minister sent Urgent telegraph to request all relevant ministries and provinces to implement all necessary actions for preventing ASF coming to Vietnam
- On 14 September 2018, Deputy Prime Minister chaired the Video Conference with all relevant ministries and 63 provinces to discuss and request implementation of necessary actions for preventing ASF coming to Vietnam
- On 15 Nov 2018, MARD approved the National Contingency Plan for preventing ASF coming Vietnam
- Compensation (Degree 02): 38.000 VND (1.8 USD) per live kg





Exercises on the detection of ASF and application of control measures in December 2018

# After the first detection of ASF in Vietnam

Member of Party  
and Government of  
all level have been  
involved in  
controlling ASF

PARTY EXECUTIVE COMMITTEE *	COMMUNIST PARTY OF VIETNAM
No. 34-CT/TW	<i>Hanoi, 20 May 2019</i>
<p style="text-align: center;"><b>DIRECTIVE</b> <b>BY PARTY SECRETARIAT</b> <b>Regarding enhancement of leadership and direction for</b> <b>effective prevention, containment and control of African Swine Fever (ASF)</b></p> <p>The Party Secretariat requests Party's committees, organizations and authorities from the central to local levels to focus on leading, directing and mobilizing the combined strength of both political system and entire society to well implement some core tasks as follows:</p> <ol style="list-style-type: none"><li>1. Consider ASF's prevention, containment, and control as a central and urgent task with a focus on leading and directing authorities, the Fatherland Front, social unions and organizations, etc. at all levels to implement measures regarding ASF's prevention and control as guided by relevant authorities, ministries and sectors in a swift, drastic and synchronized manner; be determined to put the disease under control in a shortest period of time to ensure the continued socio-economic development sustainability and improvement of people's lives.</li><li>2. Lead and direct awareness-raising for each cadre, party member and people so that everybody can be made aware of the ASF's on-going dangers and serious harms to people's economic activities and lives. The entire Party, people and armed forces should be encouraged to actively participate in the disease's prevention and combat, mitigation of economic losses and protection of social</li></ol>	

# After the first detection of ASF in Vietnam



Prime Minister, Deputy Prime Minister and Minister of MARD chaired a national video conference with all ministries and provinces to request for application of all necessary measures to control and stop spreading ASF in Vietnam

# LEADING BY PRIME MINISTER



Prime Minister visited and lead control activities at infected areas

# LEADING BY DEPUTY PRIME MINISTER



Deputy Prime Minister frequently chair the national video conferences with all provinces for discussion of prevention and control of ASF



Weekly  
organize the  
ministerial  
meeting to  
update and  
discuss  
control  
measures



  
**BÁO CÁO**  
**TÌNH HÌNH, CÔNG TÁC PHÒNG, CHỐNG**  
**BỆNH DỊCH TẬT LỢN CHẤU PHI**  
  
*Hà Nội, ngày 09 tháng 3 năm 2019*

  
**BỘ NÔNG NGHIỆP VÀ PHÁT TRIỂN NÔNG THÔN**  
  
**HỘI THẢO**  
**RA SOÁT CÁC GIẢI PHÁP PHÒNG, CHỐNG BỆNH DỊCH TẬT**  
**LỢN CHẤU PHI PHÙ HỢP VỚI THỰC TIỄN CỦA VIỆT NAM, KHU VỰC PHÍA BẮC**  
  
*Hà Nội, ngày 09 tháng 3 năm 2019*

  
**BÁO CÁO**  
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*Hà Nội, ngày 09 tháng 3 năm 2019*

National meetings to review the National Action Plan

# SUMMARY OF CURRENT CONTROL MEASURES

## 1. Timely leading by the highest level of the Government

## 2. Early detection, culling, disinfection and compensation

- Any sick pigs or suspected pigs are sampled and tested for ASF. If positive, declared immediately infected communes to apply strict control measures
- For small farms and households: Culling all pigs of infected farms; neighbouring farms without any suspect pigs are not culled, but they are under closed monitoring until the outbreak is resolved.
- For big farms with many separated pig pens: Culled only all pigs of infected pigpen; pigs in other pigpens can be kept with close monitor or slaughtered for local consumption within infected areas.
- Disinfection is applied to entire the infected and surrounding areas
- Timely compensation according to Degree 02, Decision 793/QĐ-TTg



# SUMMARY OF CURRENT CONTROL MEASURES



## 3. Movement control

- Pigs and pig products are not allowed to move out the infected areas
- Established more animal quarantine stations on the roads from the North to the South for strict movement control of pigs and pigs products

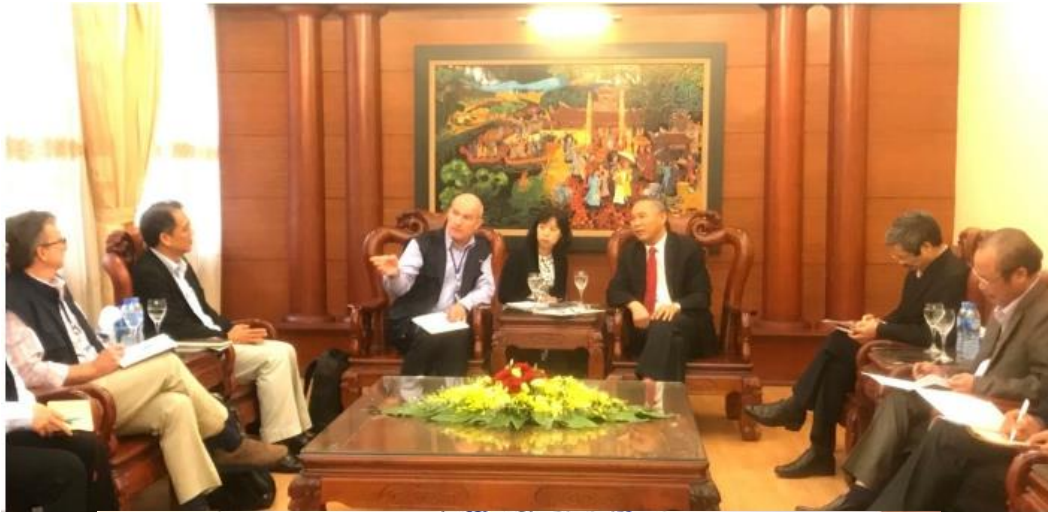
## 4. Biosecurity application

- All big farms have to apply strict biosecurity measures and frequently cleaning and disinfection of all risk factors
- Re-stock only after the outbreaks are resolved for at least 30 days; and sentinel pigs (about 10% of capacity) are stocked for another 30 days recommended

## 5. Risk communication and public awareness

## 6. Information sharing and international collaboration

- Reported to OIE, FAO; work with FAO and OIE (EMC mission)
- Frequently communicate with FAO Vietnam, IAEA/ FAO for sharing information, outbreak investigation, diagnosis and control



# Remark



- The ASF outbreak has reduced in recent months
- No new cases of (ASF) reported in 80% communes of 10 provinces over the past 30 days. Hung Yên province preparing for free ASR declaration
- Most of big and industrial farms have been protected
- Breeding farms applied strict biosecurity measures can provide piglets for restock in commercial farms
- Government has plan to replicate biosafety pig raising models
- Established 900 disease-free zones for pig production
- On going research solutions for preventive and control



**THANK YOU VERY MUCH**