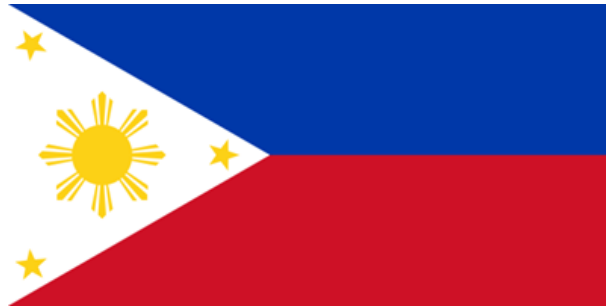


COUNTRY REPORT

PHILIPPINES



Regional Workshop on Swine Disease Diagnosis
Beijing, P. R. China, 30 – 31 Oct 2019



WORLD ORGANISATION FOR ANIMAL HEALTH

Protecting animals, preserving our future

The PHILIPPINES

3 Island Groups

Luzon (north)

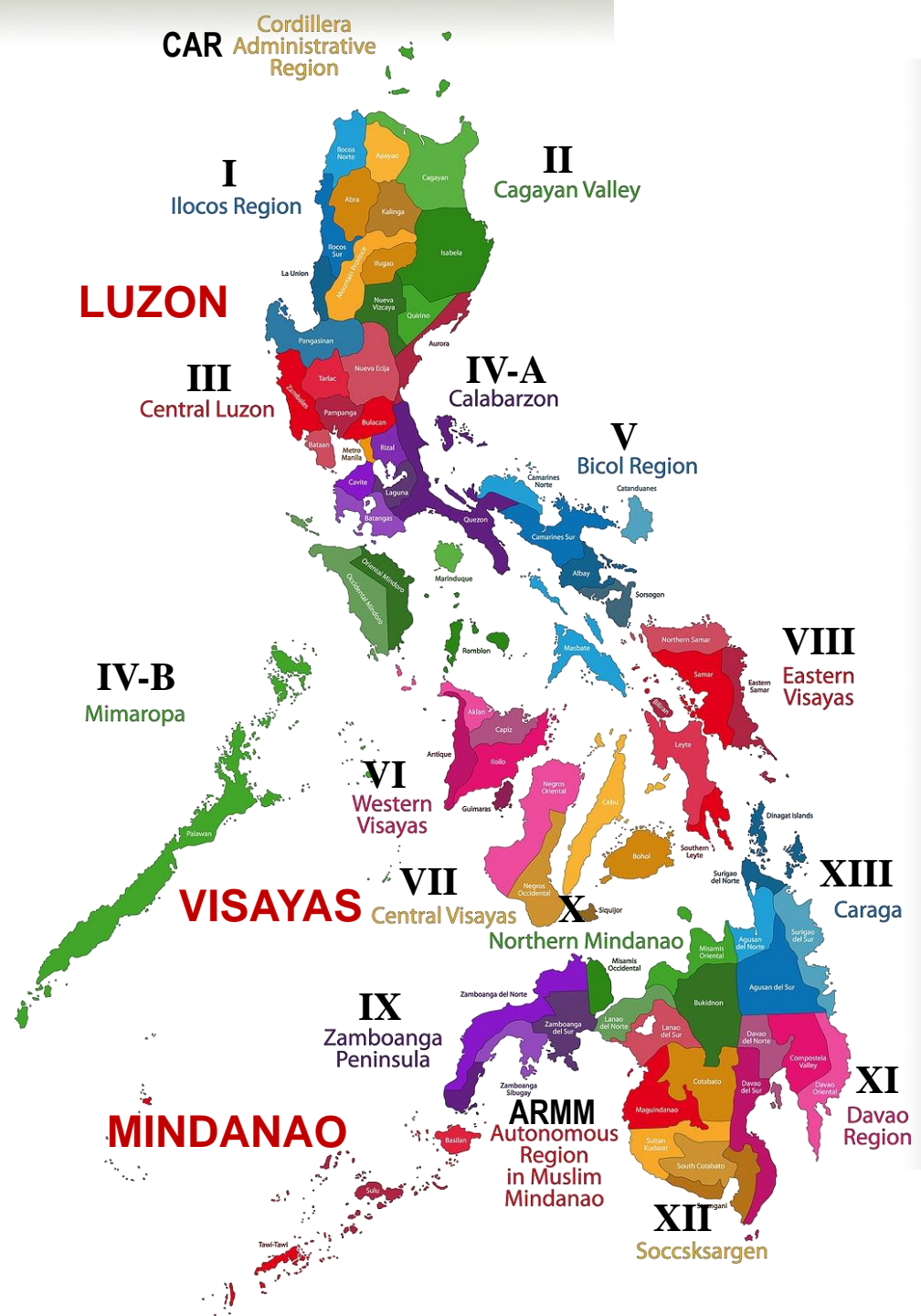
Visayas (central)

Mindanao (south)

17 Administrative Regions

No. of Provinces	81
No. of Cities	145
No of Municipalities	1,489
No. of Barangays	42,036

As of 31 December 2018



Basic information



- **Swine production** in the Philippines is a P263-billion industry and is the largest among the livestock and poultry industries of the country.
- It ranks next to rice with **18.28% contribution to the total value of agricultural production.**
- Swine production plays a major role in ensuring the country's food security by providing about **60% of the total animal meat consumption of Filipinos.**
- The Philippine swine industry is **ranked eighth** in the world in terms of the volume of pork production and number of breeding sows.
- Majority or about 65% of the pigs in the Philippines are kept by small hold pig raisers.

(DOST-PCCARD)

Basic information



PIG POPULATION

Item	2016	2017	2018
Backyard	7,959,930	8,120,087	8,092,940
Commercial	4,518,781	4,307,703	4,511,501
TOTAL	12,478,711	12,427,790	12,604,441

(Philippine Statistics Authority)

Basic information

National Laboratory System/Network

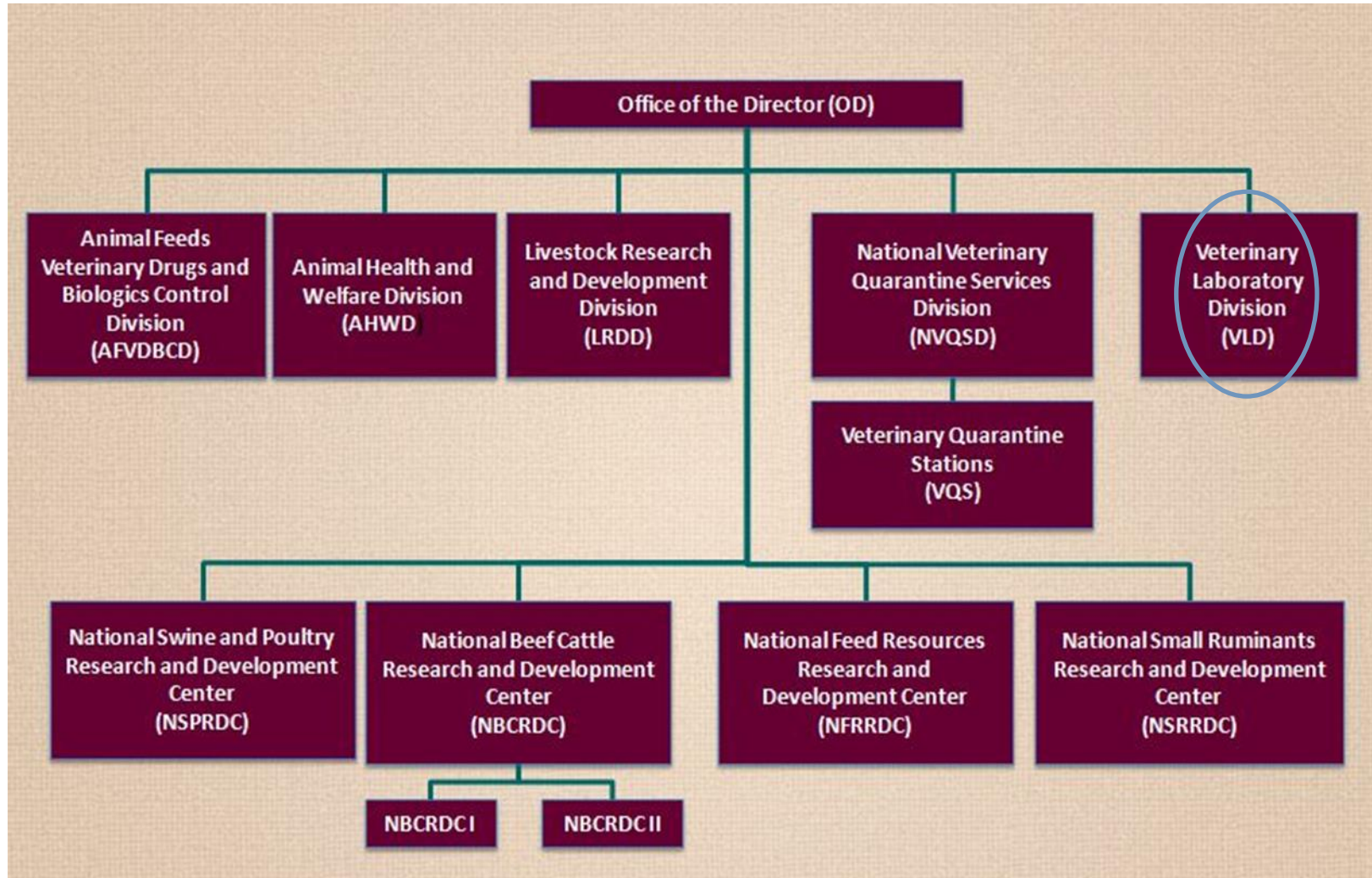
BAI-ADDRL provides Laboratory Support

- Disease Outbreak Investigation
- Disease Monitoring and Surveillance
- Quarantine
- Swine Breeder Accreditation
- Researches on Swine Diseases- Local/Int'l

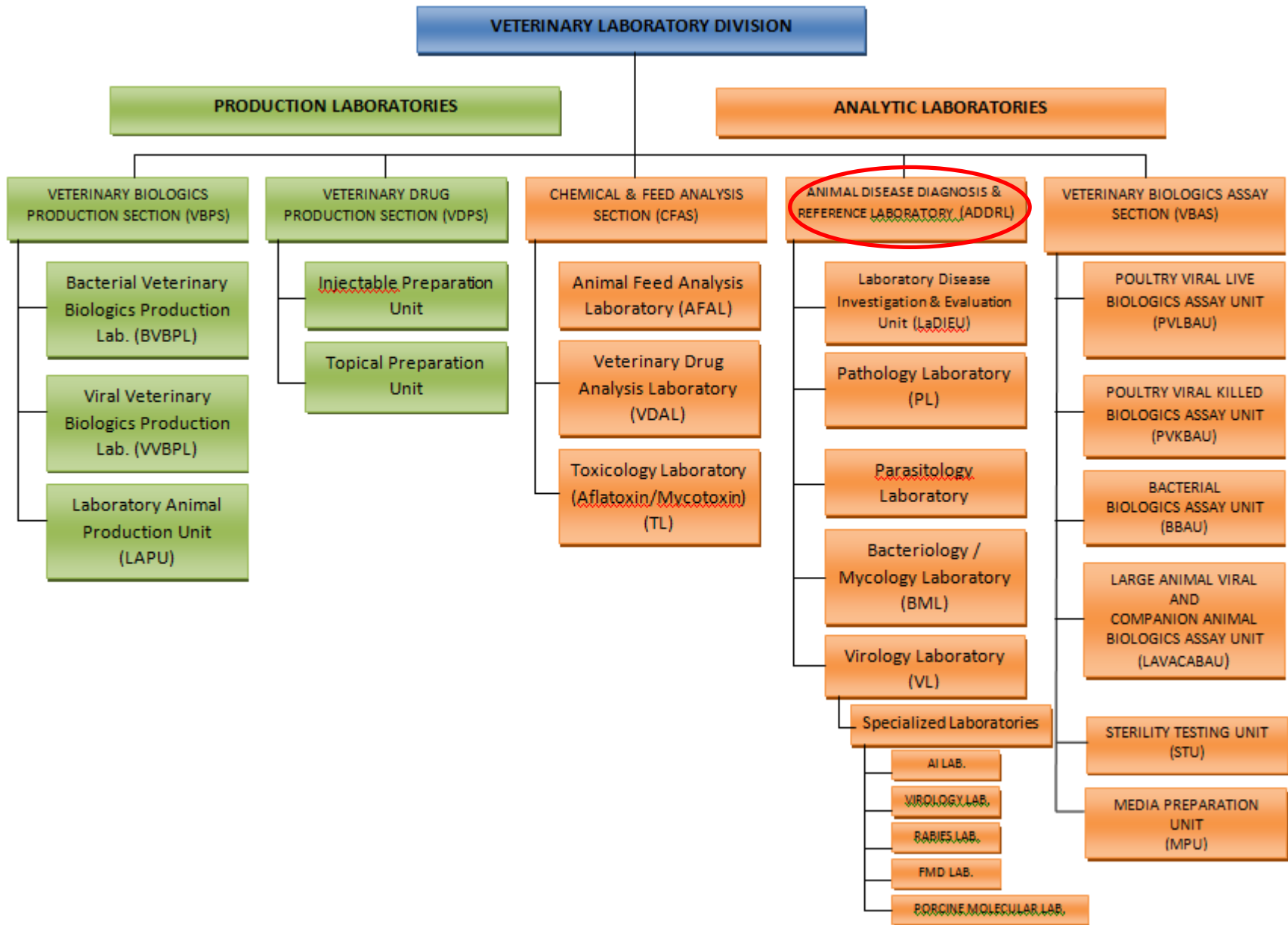


Bureau of Animal Industry

Organizational Structure



Organizational Structure



National Laboratory System/Network



- Technical assistance to 15 Regional Animal Disease Diagnostic Laboratories (RADDLs)
- Philippine Animal Health Information System (Philahis)
- **SEACFMD Laboratory Network**
- **Participation in the CSIRO-AAHL Proficiency Testing for PRRS, CSF, ASF & SIV**



Updates on disease situation



Serological Test for PRRS (Porcine Reproductive and Respiratory Syndrome)

2016		2017		2018	
Samples Tested	Samples Tested positive	Samples Tested	Samples Tested positive	Samples Tested	Samples Tested positive
1883	958	3011	1347	2946	1328
50.88%		44.74%		45.07%	

(Animal Disease Diagnosis and Reference Laboratory)

Updates on disease situation



Molecular Test for PRRS (Porcine Reproductive and Respiratory Syndrome)

2017		2018	
Sample Tested	Sample Tested positive	Sample Tested	Sample Tested positive
253	65	403	83
25.70%		20.6%	

(Animal Disease Diagnosis and Reference Laboratory)

Updates on disease situation



Serological Test for CSF (Classical Swine Fever)

2016		2017		2018	
Sample Tested	Sample Tested positive	Sample Tested	Sample Tested positive	Sample Tested	Sample Tested positive
634	150	699	184	467	154
23.66%		26.32%		32.97%	

(Animal Disease Diagnosis and Reference Laboratory)

Updates on disease situation



Molecular Test for CSF (Classical Swine Fever)

2017		2018	
Sample Tested	Sample Tested positive	Sample Tested	Sample Tested positive
3	0	94	0
0%		0%	

(Animal Disease Diagnosis and Reference Laboratory)

Updates on disease situation

Molecular Test for PED (Porcine Epidemic Diarrhea)

2017		2018	
Sample Tested	Sample Tested positive	Sample Tested	Sample Tested positive
24	3	17	0
12.5%		0%	

(Animal Disease Diagnosis and Reference Laboratory)

Foot & Mouth Disease (FMD)



***To date...
The Philippines is
FMD-free !***

Foot & Mouth Disease (FMD)

- The Philippines has maintained its Foot & Mouth Disease free status since 2011.
- To date, the country has no incidence of FMD since the last reported outbreak in 2005.



Updates on disease situation



Serological Test for FMD (Foot and Mouth Disease)

	2018		2019 January- October	
	Sample Tested	Sample Tested positive	Sample Tested	Sample Tested positive
SWINE	2537	0	2159	0
Other spp (Bovine, Caprine and Ovine)	4461	0	3423	0
TOTAL	6998	0	5582	0

(Animal Disease Diagnosis and Reference Laboratory, 2019)

Updates on disease situation



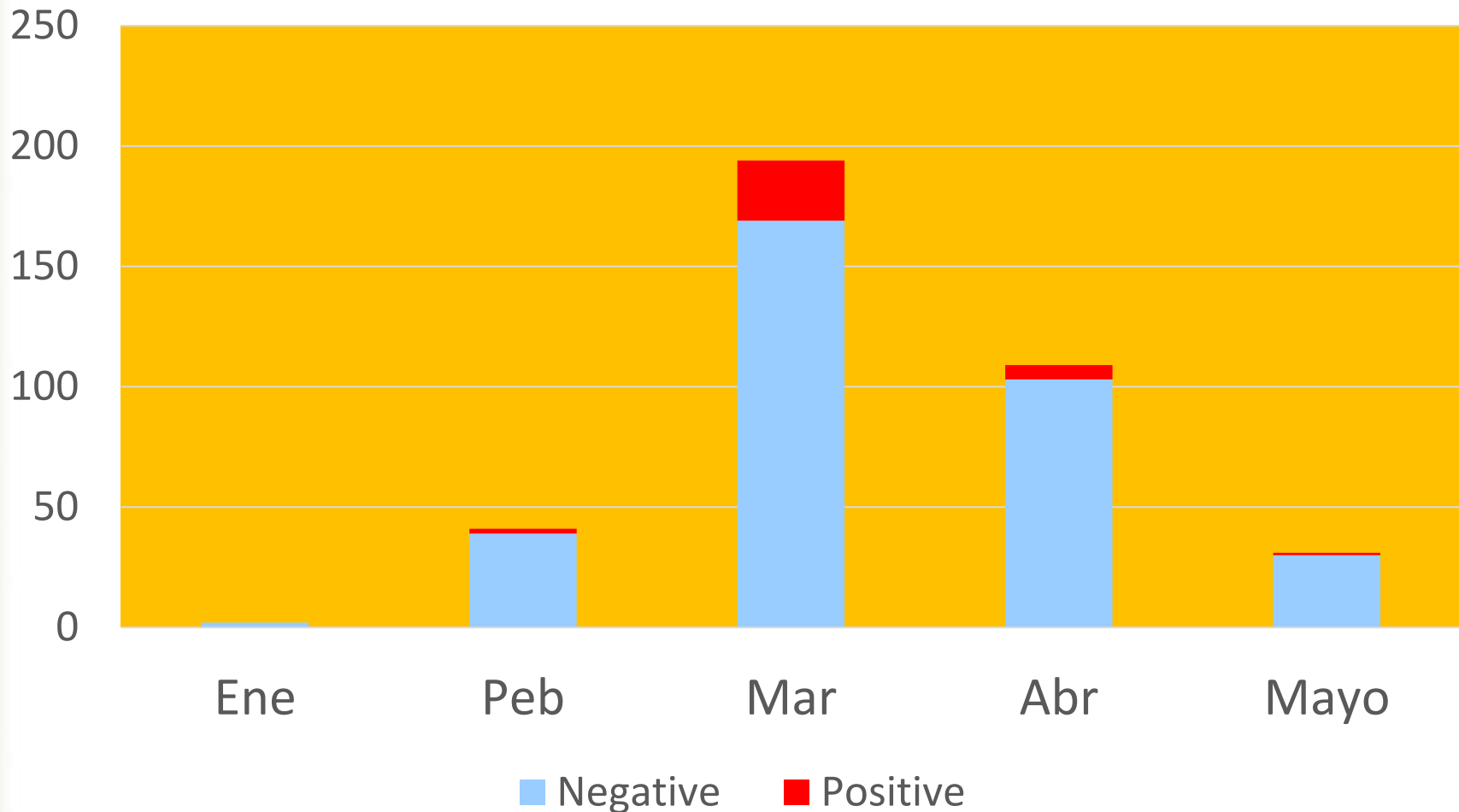
Molecular Test for African Swine Fever Surveillance *

Confiscated Meat (January – June 2019)	
Samples Tested	Samples Tested positive
400	34
8.5%	

(Animal Disease Diagnosis and Reference Laboratory)

* Before the outbreak

Confiscated samples from Inbound Travelers



Updates on disease situation



African Swine Fever

- On September 9, 2019 the Department of Agriculture notified OIE of the first occurrence of ASF in the country
- Initial case reported to the Bureau of Animal Industry (BAI) on August 13, 2019 but deaths in pigs in a backyard farm in Rodriguez, Rizal were already observed on July 25, 2019
- Clinical signs observed: petechial hemorrhages on the skin, high fever, inappetence, unable to walk, then death
- Tissue samples and serum samples from affected pigs were submitted and tested positive for ASF viral DNA using ASF Taqman PCR assay (source: AAHL protocol based on King, et al, 2003)

Updates on disease situation



African Swine Fever

- Second case reported to the Bureau of Animal Industry (BAI) on August 20, 2019 but deaths in pigs in a backyard farm in another municipality in Antipolo, Rizal were already observed on August 7, 2019
- Clinical signs observed: Fever, inappetence, incoordination, conjunctivitis, premature birth with mummified fetuses
- Tissue samples from affected pig were submitted and tested positive for ASF viral DNA using ASF Taqman PCR assay
- Blood samples from apparently healthy pigs from a stockyard ready for slaughter in a province in Luzon were submitted and also tested positive for ASF viral DNA using ASF Taqman PCR assay
- Twenty samples were submitted to the Pirbright Laboratory for confirmatory testing



International Flights



FOOD WASTES

Hotels and Restaurants



Smuggler China Pork



RIZAL

Landfill

Swill traders

Backyard farmers

Pig/Pork traders



BULACAN

Pig/Pork traders

Stockyard

Backyard farmers



Waterways



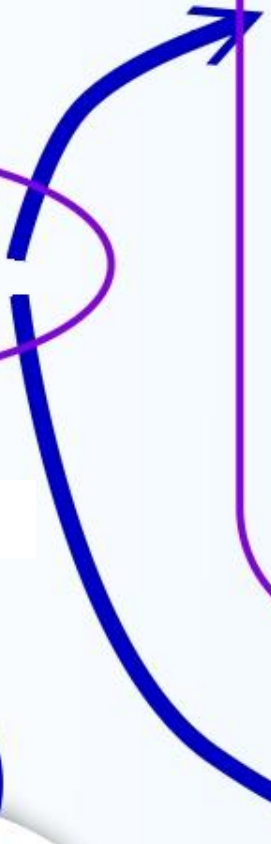
QUEZON CITY

Landfill

Swill traders

Backyard farmers

Pig/Pork traders



Updates on disease situation



Molecular Test for African Swine Fever

<i>(August-October 18, 2019)</i>	
Samples Tested	Samples Tested positive
6,616	319
4.82%	

(Animal Disease Diagnosis and Reference Laboratory)

Swine diseases diagnosis

Diagnostic capacity of ADDRL

- **Serology**
 - Enzyme Linked Immunosorbent Assay (ELISA)**
 - Antibody detection test
 - Antigen detection test
- **Molecular Test**
 - Realtime PCR
 - Conventional PCR

Swine diseases diagnosis

Tests for Major Swine Diseases

- **Realtime PCR Assay**

ASF , PRRS, PRV, CSF, SIV, PED, TGE, FMD
PCV2 and RESTV

- **ELISA– Antigen detection**

CSF

- **ELISA– Antibody detection**

PRRS, PRV, CSF, SIV, PED, TGE, FMD and
RESTV

Swine diseases diagnosis

Results and Analysis for ASF (The Pirbright Institute)

- **14/20 samples submitted to the Pirbright Lab were confirmed to be positive for ASF by ASF PCR and UPL PCR**
- **6/20 samples which tested positive for PCR were also positive in the virus isolation**

Swine disease diagnosis

Results and Analysis for ASF (The Pirbright Insitute)

- **Phylogenetic analysis was performed on seven isolates and these were found to have identical p72 gene sequence**
- **The phylogenetic tree is unrooted hence its ancestral lineage cannot be assumed**
- **Same samples shared 100% identical p72 sequence with China 2018, Zambia 1991, Madagascar 2003 and Poland 2014 strains**
- **These sequences were classified as Genotype 2**

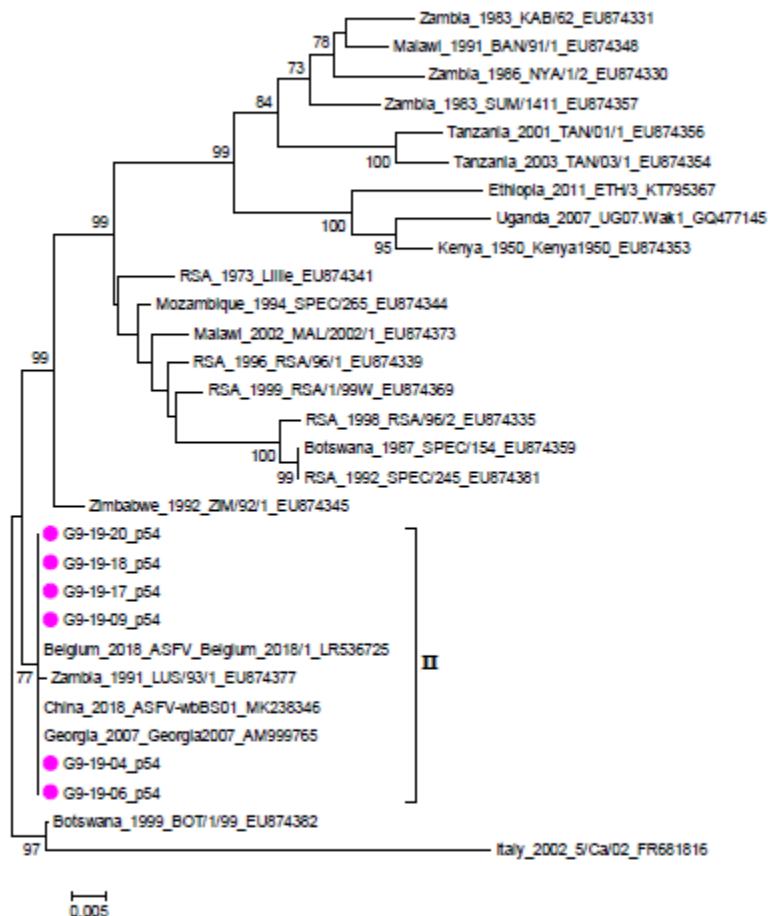
Swine disease diagnosis

Results and Analysis for ASF (The Pirbright Insitute)

- **Phylogenetic analysis was performed six isolates and these were found to have identical p54 gene sequence**
- **The phylogenetic tree is unrooted hence its ancestral lineage cant be assumed**
- **Same six samples shared 100% identical p54 sequence with China 2018, Belgium 2018, and Georgia 2007**
- **These sequences were classified as Genotype 2**

Epidemiology Report

Comparison of 654 bp of the p54 gene



Swine disease diagnosis

Results and Analysis for ASF (The Pirbright Insitute)

- ***Sequences of the four isolates were 100% identical across the intergenic region I73R and I329L genes***
- ***These had the insertion of 10 additional nucleotides (nt) in comparison to ASFV Georgia 2007/1***
- ***Same 10 nt insertion were observed in other Genotype II strains such as: China 2018, Belgium 2018, Estonia 2014, Russia 2015 and Ukraine 2016***

Epidemiology Report



Partial nucleotide sequence alignment of the Intergenic region between I73R and I329L genes

```

Armenia_2007_K3620029      AGGAATATATAGGAATATA-----TAGAAATATATAGAAATAGCTAAGCTTAATCTAACTCAGCTTTTTTTT
Belarus_Geod90_2013_K3620043  AGGAATATATAGGAATATAAGGAATATATAGAAATATATAGAAATAGCTAAGCTTAATCTAACTCAGCTTTTTTTT
Belgium_2019/1_E8537125    AGGAATATATAGGAATATAAGGAATATATAGAAATATATAGAAATAGCTAAGCTTAATCTAACTCAGCTTTTTTTT
Belgium_2018/2/Ea114_MR9801359  AGGAATATATAGGAATATAAGGAATATATAGAAATATATAGAAATAGCTAAGCTTAATCTAACTCAGCTTTTTTTT
Belgium_Eta16/wb/2018_MR543  AGGAATATATAGGAATATAAGGAATATATAGAAATATATAGAAATAGCTAAGCTTAATCTAACTCAGCTTTTTTTT
China_2018/Azhul3C090_MR12499  AGGAATATATAGGAATATAAGGAATATATAGAAATATATAGAAATAGCTAAGCTTAATCTAACTCAGCTTTTTTTT
China_2018_M8735144        AGGAATATATAGGAATATAAGGAATATATAGAAATATATAGAAATAGCTAAGCTTAATCTAACTCAGCTTTTTTTT
China_2011/17_2019_MR194957  AGGAATATATAGGAATATA-----TAGAAATATATAGAAATAGCTAAGCTTAATCTAACTCAGCTTTTTTTT
China_Pig/HJ/2019_MR333140    AGGAATATATAGGAATATAAGGAATATATAGAAATATATAGAAATAGCTAAGCTTAATCTAACTCAGCTTTTTTTT
China_SV18_2018_MH717104    AGGAATATATAGGAATATAAGGAATATATAGAAATATATAGAAATAGCTAAGCTTAATCTAACTCAGCTTTTTTTT
China_wb801_2018_M8238345    AGGAATATATAGGAATATA-----TAGAAATATATAGAAATAGCTAAGCTTAATCTAACTCAGCTTTTTTTT
China_wb801_2018_M9545909    AGGAATATATAGGAATATA-----TAGAAATATATAGAAATAGCTAAGCTTAATCTAACTCAGCTTTTTTTT
Croatia_2014_10470113       AGGAATATATAGGAATATAAGGAATATATAGAAATATATAGAAATAGCTAAGCTTAATCTAACTCAGCTTTTTTTT
09-16-17_Philippinee       AGGAATATATAGGAATATAAGGAATATATAGAAATATATAGAAATAGCTAAGCTTAATCTAACTCAGCTTTTTTTT
09-16-09_Philippinee       AGGAATATATAGGAATATAAGGAATATATAGAAATATATAGAAATAGCTAAGCTTAATCTAACTCAGCTTTTTTTT
09-16-14_Philippinee       AGGAATATATAGGAATATAAGGAATATATAGAAATATATAGAAATAGCTAAGCTTAATCTAACTCAGCTTTTTTTT
09-16-17_Philippinee       AGGAATATATAGGAATATAAGGAATATATAGAAATATATAGAAATAGCTAAGCTTAATCTAACTCAGCTTTTTTTT
Georgia_2007/1_Y9682468     AGGAATATATAGGAATATA-----TAGAAATATATAGAAATAGCTAAGCTTAATCTAACTCAGCTTTTTTTT
Georgia_2008/1_MR910495     AGGAATATATAGGAATATA-----TAGAAATATATAGAAATAGCTAAGCTTAATCTAACTCAGCTTTTTTTT
Georgia_2008/2_MR910496     AGGAATATATAGGAATATA-----TAGAAATATATAGAAATAGCTAAGCTTAATCTAACTCAGCTTTTTTTT
Poland_Podlaska2_2015_MR6614  AGGAATATATAGGAATATA-----TAGAAATATATAGAAATAGCTAAGCTTAATCTAACTCAGCTTTTTTTT
Rumeta_Belgorod_06/14_KP1376  AGGAATATATAGGAATATAAGGAATATATAGAAATATATAGAAATAGCTAAGCTTAATCTAACTCAGCTTTTTTTT
Rumeta_Bryansk_02/14_KP13763  AGGAATATATAGGAATATAAGGAATATATAGAAATATATAGAAATAGCTAAGCTTAATCTAACTCAGCTTTTTTTT
Rumeta_Bryansk_05/14_KP13763  AGGAATATATAGGAATATA-----TAGAAATATATAGAAATAGCTAAGCTTAATCTAACTCAGCTTTTTTTT
Rumeta_Bryansk_2015_RY345494  AGGAATATATAGGAATATAAGGAATATATAGAAATATATAGAAATAGCTAAGCTTAATCTAACTCAGCTTTTTTTT
Rumeta_Irkutsk_2017_KY982443  AGGAATATATAGGAATATA-----TAGAAATATATAGAAATAGCTAAGCTTAATCTAACTCAGCTTTTTTTT
Rumeta_Kaliuga_01/14_KP137639  AGGAATATATAGGAATATAAGGAATATATAGAAATATATAGAAATAGCTAAGCTTAATCTAACTCAGCTTTTTTTT
Rumeta_Kaliuga_08/14_KP137643  AGGAATATATAGGAATATAAGGAATATATAGAAATATATAGAAATAGCTAAGCTTAATCTAACTCAGCTTTTTTTT
Rumeta_KashinRy09/2012_KP1  AGGAATATATAGGAATATA-----TAGAAATATATAGAAATAGCTAAGCTTAATCTAACTCAGCTTTTTTTT
Rumeta_Lipetsk_2016_KY345494  AGGAATATATAGGAATATAAGGAATATATAGAAATATATAGAAATAGCTAAGCTTAATCTAACTCAGCTTTTTTTT
Rumeta_Moscow_07/13_KP137629  AGGAATATATAGGAATATA-----TAGAAATATATAGAAATAGCTAAGCTTAATCTAACTCAGCTTTTTTTT
Rumeta_N.Novgorod_07/13_KP13  AGGAATATATAGGAATATA-----TAGAAATATATAGAAATAGCTAAGCTTAATCTAACTCAGCTTTTTTTT
Rumeta_Smolensk_05/14_KP1376  AGGAATATATAGGAATATA-----TAGAAATATATAGAAATAGCTAAGCTTAATCTAACTCAGCTTTTTTTT
Rumeta_Smolensk_09/12_KP1376  AGGAATATATAGGAATATAAGGAATATATAGAAATATATAGAAATAGCTAAGCTTAATCTAACTCAGCTTTTTTTT
Rumeta_Tula_01/14_KP137644    AGGAATATATAGGAATATAAGGAATATATAGAAATATATAGAAATAGCTAAGCTTAATCTAACTCAGCTTTTTTTT
Rumeta_Tula_02/14_KP137640    AGGAATATATAGGAATATAAGGAATATATAGAAATATATAGAAATAGCTAAGCTTAATCTAACTCAGCTTTTTTTT
Rumeta_Tula_06/13_KP137641    AGGAATATATAGGAATATAAGGAATATATAGAAATATATAGAAATAGCTAAGCTTAATCTAACTCAGCTTTTTTTT
Rumeta_Tula_08/13_KP137633    AGGAATATATAGGAATATAAGGAATATATAGAAATATATAGAAATAGCTAAGCTTAATCTAACTCAGCTTTTTTTT
Rumeta_Tve206/2012_KP137626  AGGAATATATAGGAATATA-----TAGAAATATATAGAAATAGCTAAGCTTAATCTAACTCAGCTTTTTTTT
Rumeta_Volgograd_07/14_KP137  AGGAATATATAGGAATATAAGGAATATATAGAAATATATAGAAATAGCTAAGCTTAATCTAACTCAGCTTTTTTTT
Rumeta_Volgograd_02/14_KP137  AGGAATATATAGGAATATAAGGAATATATAGAAATATATAGAAATAGCTAAGCTTAATCTAACTCAGCTTTTTTTT
Rumeta_Volgograd_2015_RY3458  AGGAATATATAGGAATATAAGGAATATATAGAAATATATAGAAATAGCTAAGCTTAATCTAACTCAGCTTTTTTTT
Rumeta_Voronozh_07/13_KP13763  AGGAATATATAGGAATATAAGGAATATATAGAAATATATAGAAATAGCTAAGCTTAATCTAACTCAGCTTTTTTTT
Rumeta_Voronozh_2016_KY345899  AGGAATATATAGGAATATAAGGAATATATAGAAATATATAGAAATAGCTAAGCTTAATCTAACTCAGCTTTTTTTT
Tanzania_2017_01_M6577991    AGGAATATATAGGAATATA-----TAGAAATATATAGAAATAGCTAAGCTTAATCTAACTCAGCTTTTTTTT
Tanzania_2017_02_M6577992    AGGAATATATAGGAATATA-----TAGAAATATATAGAAATAGCTAAGCTTAATCTAACTCAGCTTTTTTTT
Tanzania_2017_03_M6577993    AGGAATATATAGGAATATA-----TAGAAATATATAGAAATAGCTAAGCTTAATCTAACTCAGCTTTTTTTT
Tanzania_2017_04_M6577994    AGGAATATATAGGAATATA-----TAGAAATATATAGAAATAGCTAAGCTTAATCTAACTCAGCTTTTTTTT
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Tanzania_2017_M6577996       AGGAATATATAGGAATATA-----TAGAAATATATAGAAATAGCTAAGCTTAATCTAACTCAGCTTTTTTTT
Tanzania_2017_M6577997       AGGAATATATAGGAATATA-----TAGAAATATATAGAAATAGCTAAGCTTAATCTAACTCAGCTTTTTTTT
Ukraine_Ryiv2016/131_M81945   AGGAATATATAGGAATATAAGGAATATATAGAAATATATAGAAATAGCTAAGCTTAATCTAACTCAGCTTTTTTTT
Ukraine_Ukr12/Exp0_2012_K262  AGGAATATATAGGAATATAAGGAATATATAGAAATATATAGAAATAGCTAAGCTTAATCTAACTCAGCTTTTTTTT

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Analysis performed by:

Digitally signed by Paulina
Date: 2019.09.25 16:02:12
+01'00'

Dr Paulina Rajko-Nenow (Signature & Date)

Results Approved by:

Dr John Flannery
2019.09.26 08:34:33 +01'00'

Dr John Flannery (Signature & Date)

If further information is required concerning these results please contact Dr Carrie Batten, Head of Non-Vesicular Reference Laboratories, tel +44(0)1483 231344, e-mail carrie.batten@pirbright.ac.uk

What worked well



- ***Previous trainings by FAO, OIE, IAEA on the use of Taqman PCRs for swine disease diagnosis including ASF in the past had helped in capacitating the lab and preparing for ASF diagnosis***
- ***Participation in the annual Proficiency Testing by AAHL/FAO since 2012 contributed a lot in gaining good efficiency and confidence in performing Taqman PCR assays***
- ***Laboratory networking helped the lab in having access to the different standard protocols that we can use should our protocol does not work***

The winning side of the outbreak

MARS RAVELO'S
DARNA

Diminished damage

Amazing cooperation

Rapid response

National awareness

Abandonment of bad husbandry



Challenges and possible solution



Challenges	Solution
Influx of samples for ASF / differential diseases diagnosis at the National Laboratory (ADDRL)	Capacitate the Regional Laboratories thru on site training and providing technical and financial assistance
Lack of capability to do virus isolation or other test methods such as FAT, etc	Collaborate with regional/reference labs for conduct of training
Lack of manpower and resources	Elevate problem to authorities
Prevent further spread to other provinces	Early detection and rapid response

Where are you today?

Disease Control Measures

- Locate, hold and cull
- Improve surveillance and reporting
- Educate stakeholders
- Mobilize Supporters
- Protect free zones
- Optimize bio-security

PREVENTION STRATEGIES

BAN pork imports

AVOID swill feeding

BLOCK entry of hand-carried meat

EDUCATE our people

SUBMIT lab samples



Recovery

THANK YOU FOR YOUR ATTENTION!

Oie



colour box