

# Retrospective Study on the Epidemiology of **African Swine Fever** Outbreaks in the Philippines

Presented by Raul M. Berro DVM, FPCSP

*Philippine Swine Foundation (PSF)*

*Philippine College of Swine Practitioners (PCSP)*

Researchers:

*Romulo Parayao, DVM, DipPCSP, Aleli B. Marasigan, DVM, FPCSP, Emmanuel Tanael, DVM*

# OBJECTIVES of the STUDY

- a) **To analyze the Philippine epidemiological data on ASF;**
- b) **To evaluate and identify the risk factors** involved with its occurrence and spread;
- c) **To evaluate the control measures** applied by the National and Local Government for controlling the spread of the disease and assess their effectiveness;
- d) **To evaluate the robustness and effectiveness** of the National Zoning Plan for the determination of the movement areas; and
- e) **To submit policy recommendations on ASF control and prevention.**



# ABSTRACT

African swine fever virus (ASFV) is a DNA virus belonging in the *Asfarviridae* Family; genus *Asfivirus*, the sole member belonging to this Family and is the only known DNA arbovirus (WOAH, 2022).

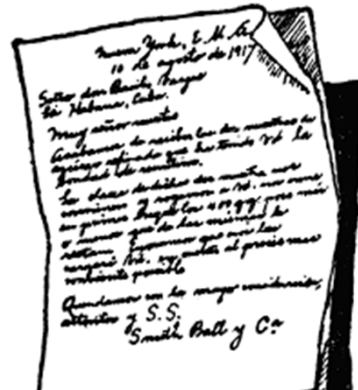
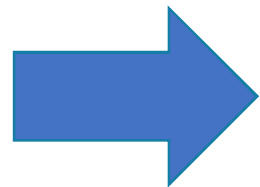
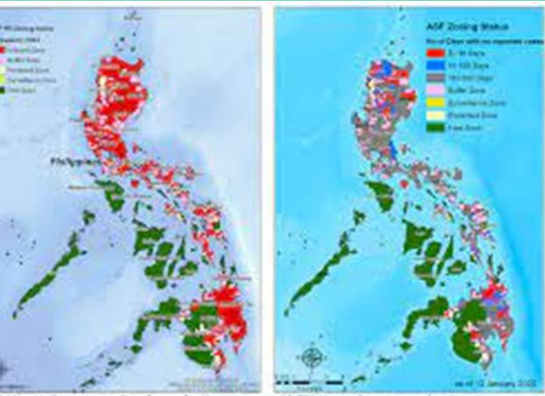
This retrospective study made use of questionnaires to the ff: farmers, traders, slaughterhouses, meat vendors, feed dealers and the local government units (LGU).

The study **identified seven (7) risk factors that possibly contributed** to the spread of the disease as well as **seven (7) protective factors** that possibly help in preventing the ASF infection.

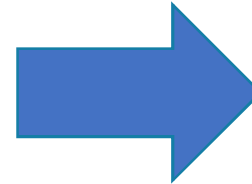


# Methodology

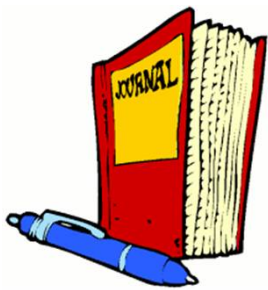
1. Identify provinces to be included in the study



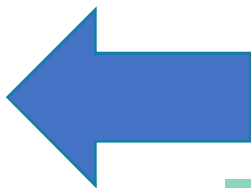
2. Send letters to Governors & PVO



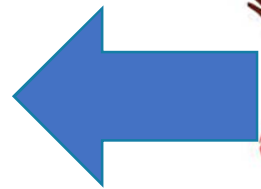
3. PVO assigns cities and municipalities for the study



6. Write-up



5. Data consolidation and analysis



4. Conduct visits for interview of participants or use of online survey

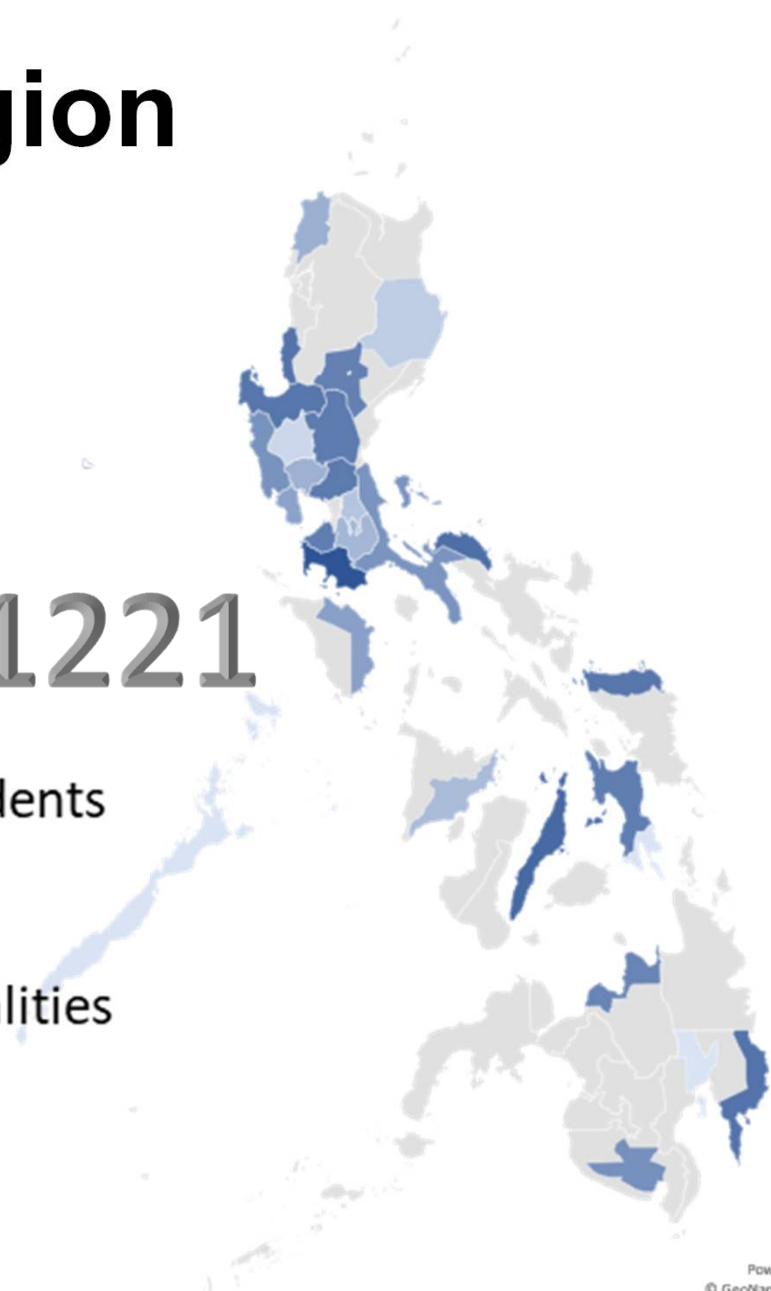


# Survey Respondents per Region

REGION	DISTRIBUTION (%)
Region III	20.3%
Region IV A	19.4%
Region I	13.2%
Region VIII	10.2%
Region VII	5.9%
Region II	5.9%
Region V	5.6%
Region XI	5.5%
Region X	4.6%
Region XII	4.0%
Region IV B	3.4%
Region VI	2.0%
R	0.1%

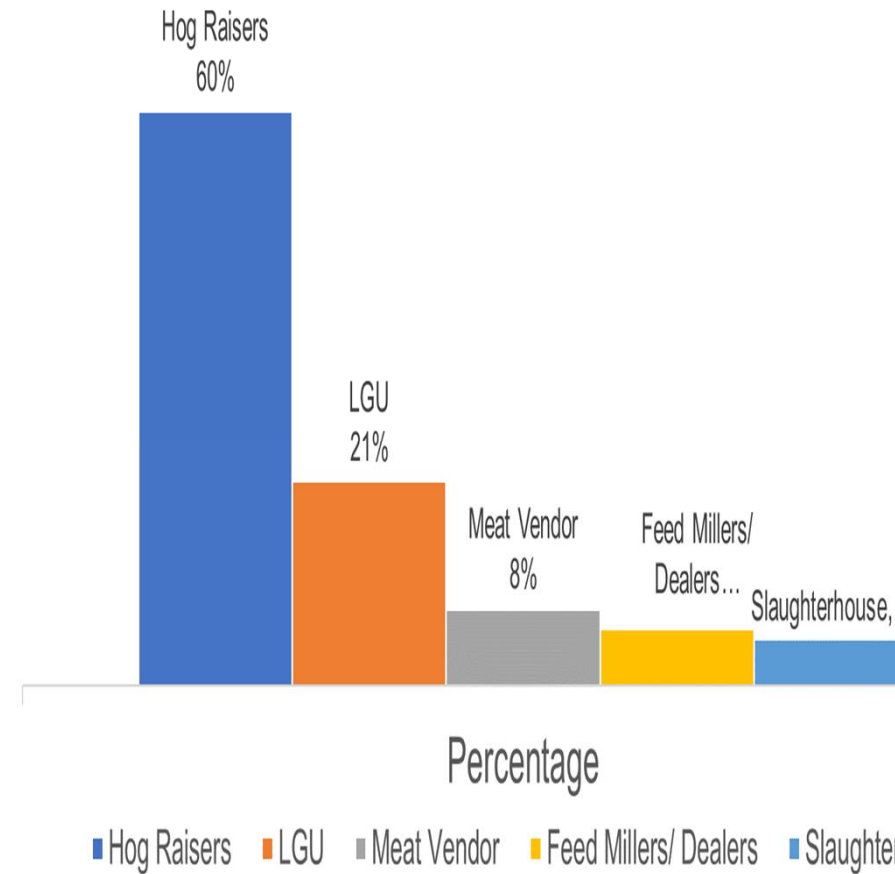
Total = 1221

1221 respondents  
13 regions  
30 provinces  
130 municipalities

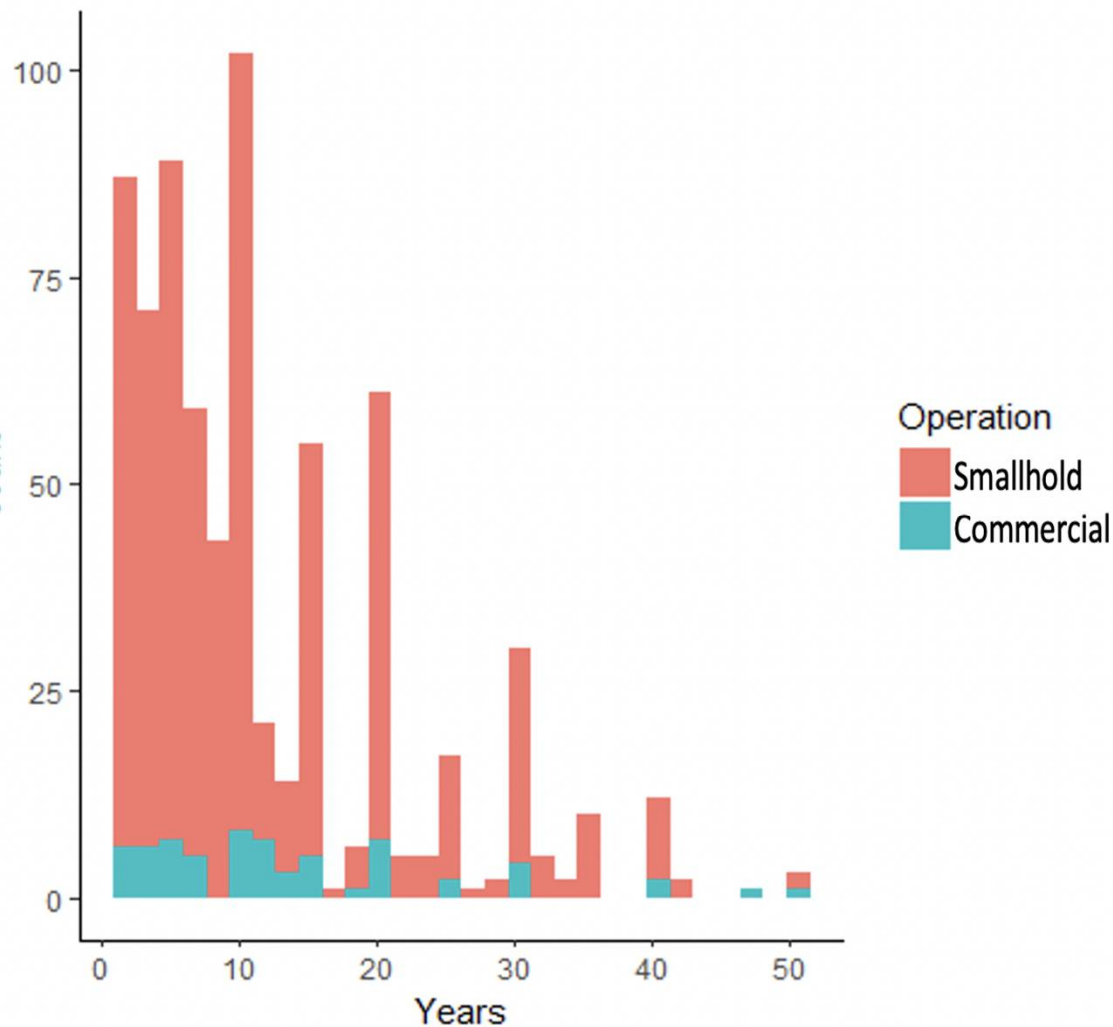


# DATA DISTRIBUTION

Category	Luzon	Visayas	Mindanao	Total
Hog Raisers	505	127	100	732
LGU	164	58	38	260
Meat Vendor	69	12	17	98
Feed Millers/ Dealers	46	17	10	73
Slaughterhouse	45	8	7	60
<b>Total</b>	<b>829</b>	<b>222</b>	<b>172</b>	<b>1223</b>



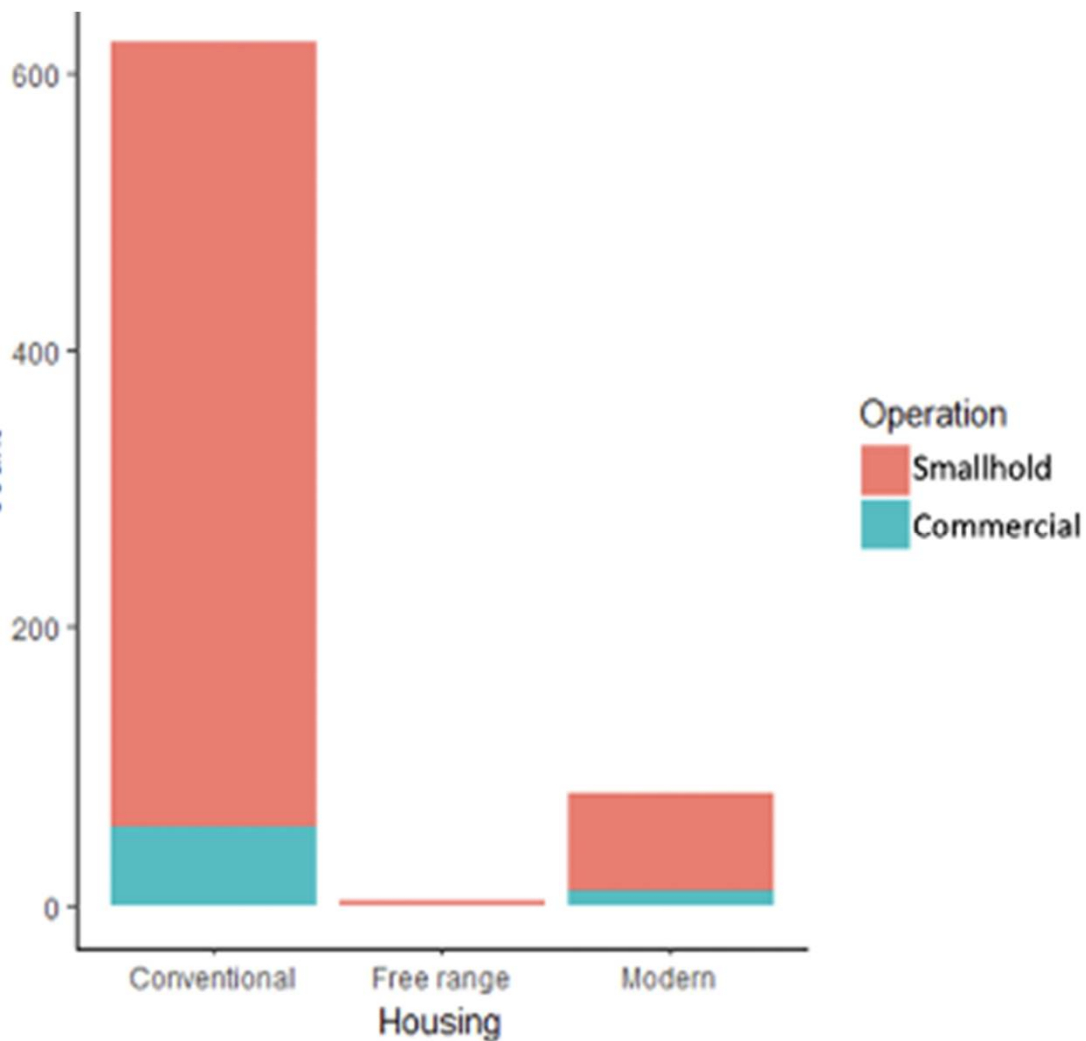
## Distribution: Years of experience



- There were 732 swine raisers participated in the survey.
- **667 (91%) respondents with smallhold.**
- Most have ten (10) years of experience.



## Distribution: Housing type

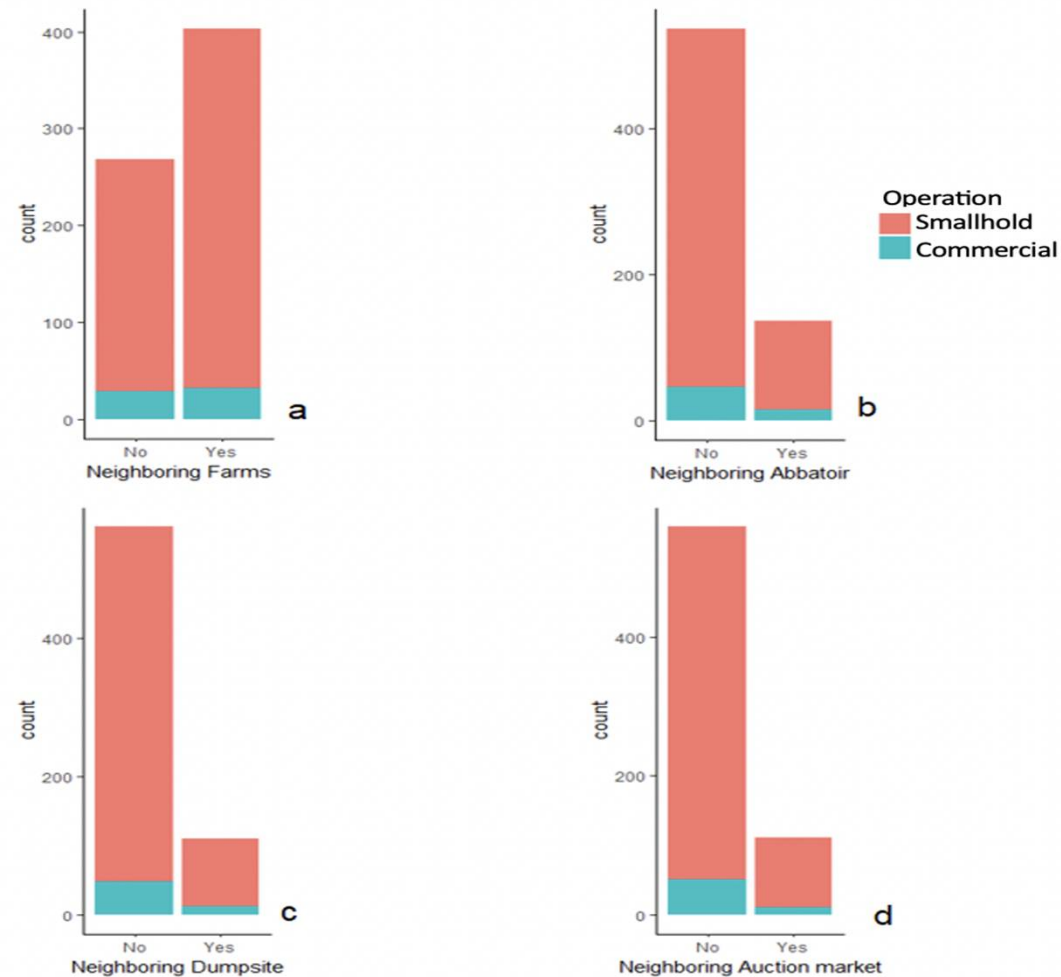


- The majority (88.56%) of the raisers have a **conventional type** of pig building for both the smallhold and commercial operations.





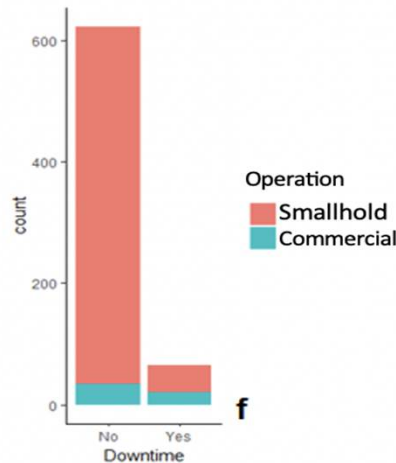
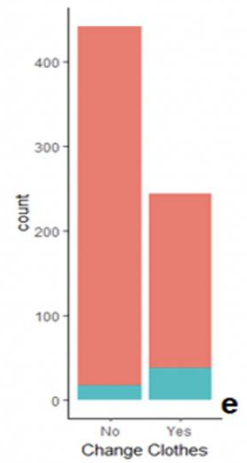
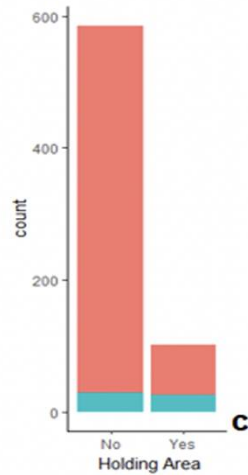
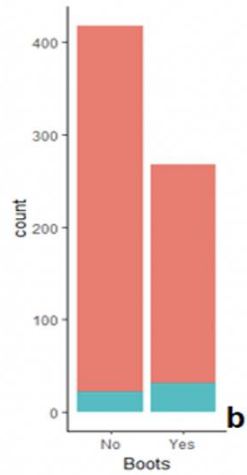
# Distribution: Farm location



- **60% of the raisers** claimed to have neighboring piggeries
- **21% of the raisers** claim to be close to slaughterhouse
- **16%** are close to dumpsites
- **17%** of the respondents that are located close to auction markets.



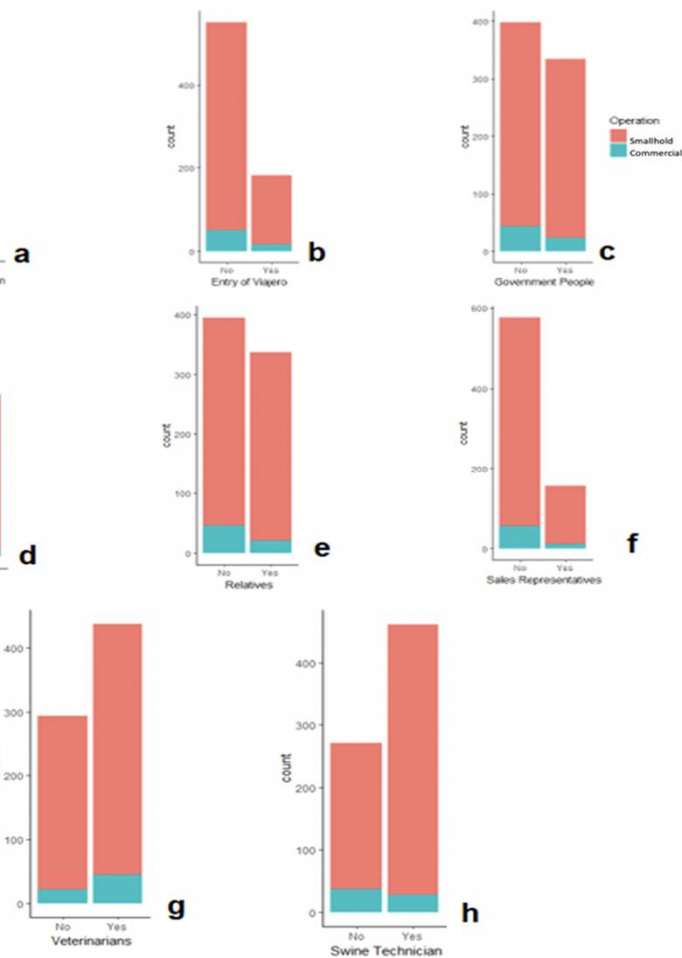
# Distribution: Scale of Biosecurity Practices



- Bathing prior to entry to farm is implemented only by **26.4% of the farmers.**
- **Only 36%** changed clothing
- **Only 39%** changed boots
- **Only 42%** have foot baths
- **15%** have holding areas



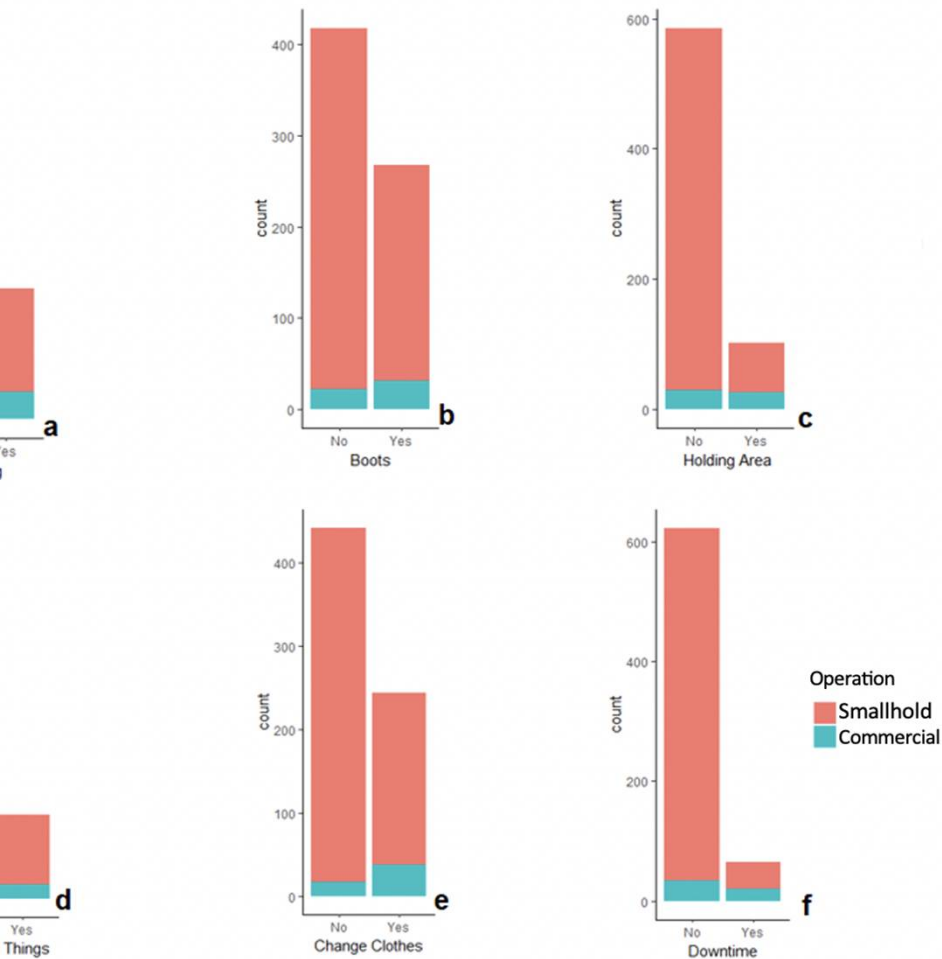
# Distribution: Accepting visitors



- 21% allowed entry of salesmen
- 33% allow middlemen to enter farms
- 41% allow customers inside the farm
- 46% allow government officials
- 46% welcome their relatives inside
- 60% given entry to veterinarians
- 63% given permission to technicians



# Distribution: Biosecurity Practices of accepting visitors

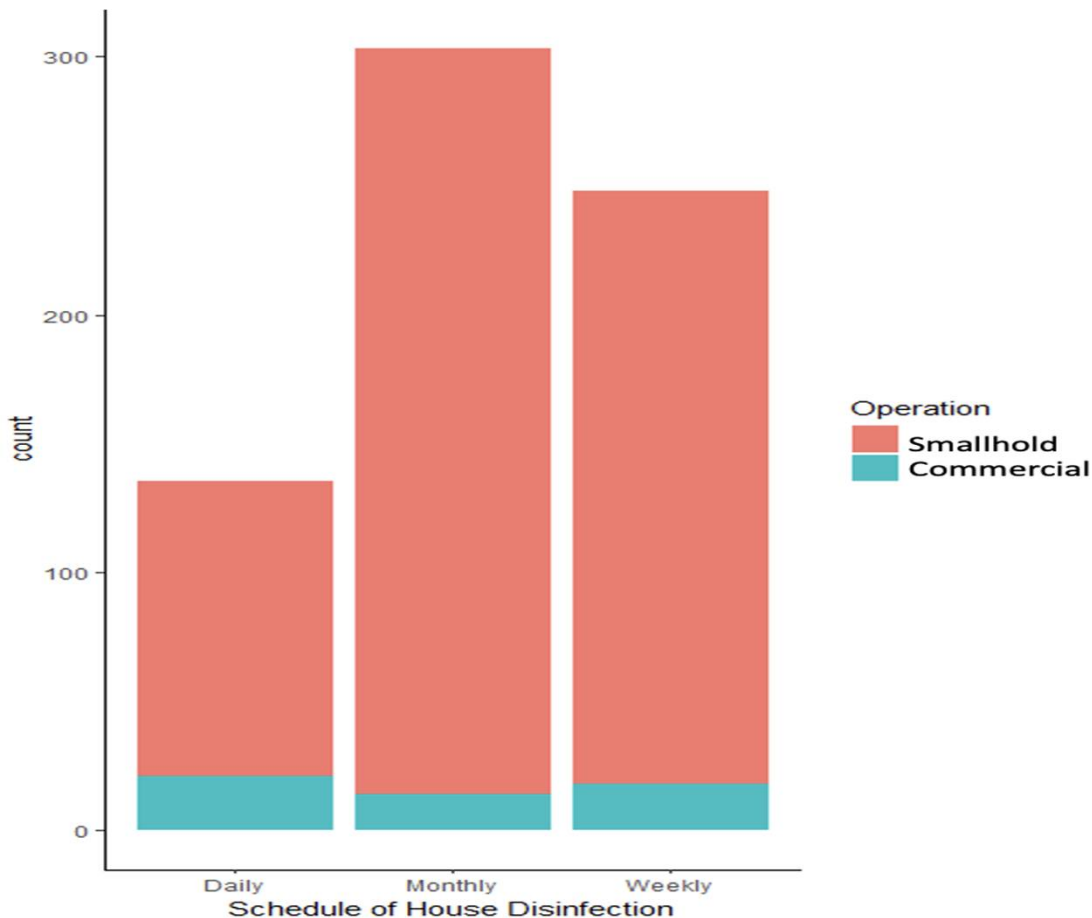


- **Downtime** practice for visitors is **only 10%**
- **Only 5%** practice **dis-infection** at **the farm entrance.**
- **Only 18%** **prohibit** the entry of **personal things\*** to the farm

*\* cellphone, wallet, keys, watch*



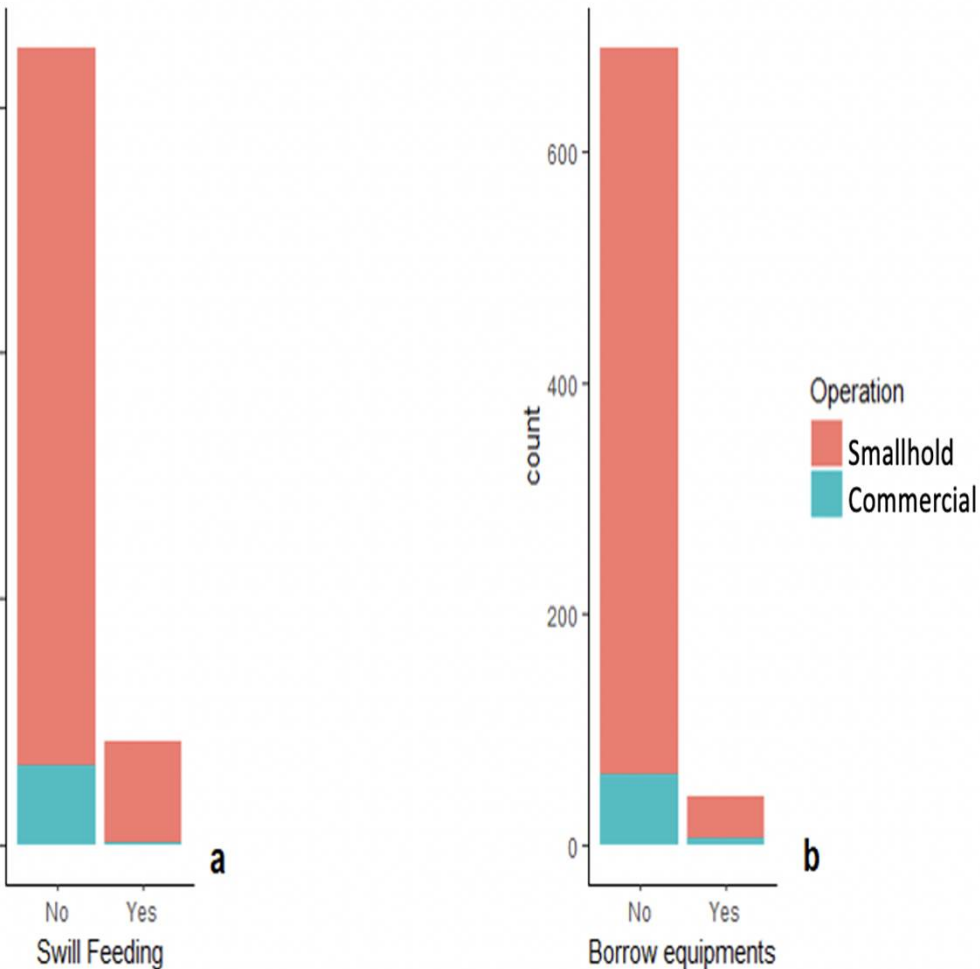
## Distribution: Pig house disinfection and scale of operation



- **Conducting once month disinfection is common practice.**
- This is followed by weekly disinfection



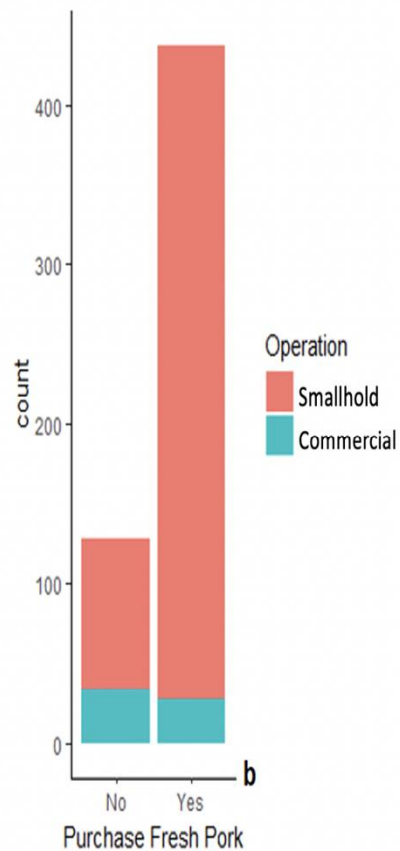
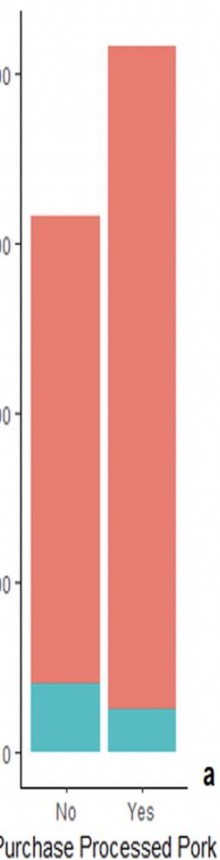
## Distribution: Swill feeding practice and Borrowing of equipment



- **12% of the raisers are still practicing swill feeding.**
- **Farm practice is mixing swill feeds and commercial feeds.**
- Respondents who are giving swill feeds are mixing by-products (Rice bran) with commercial feeds.



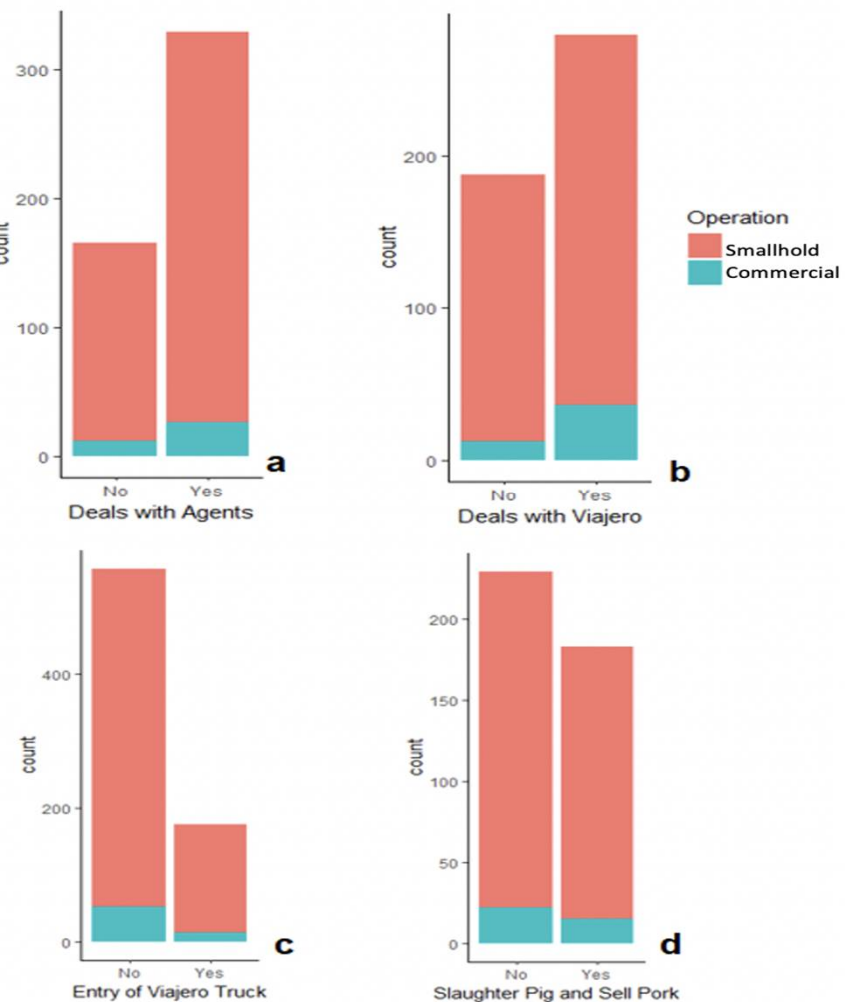
## Distribution: Pork Purchase (a. fresh, b. processed) practices



- **78% allow entry of fresh pork** to their farm premises.
- **57% allow the entry of processed pork products** within the farm premises.
- **81% are smallhold raisers** while **46% of commercial**.



# Distribution: Sales involvement

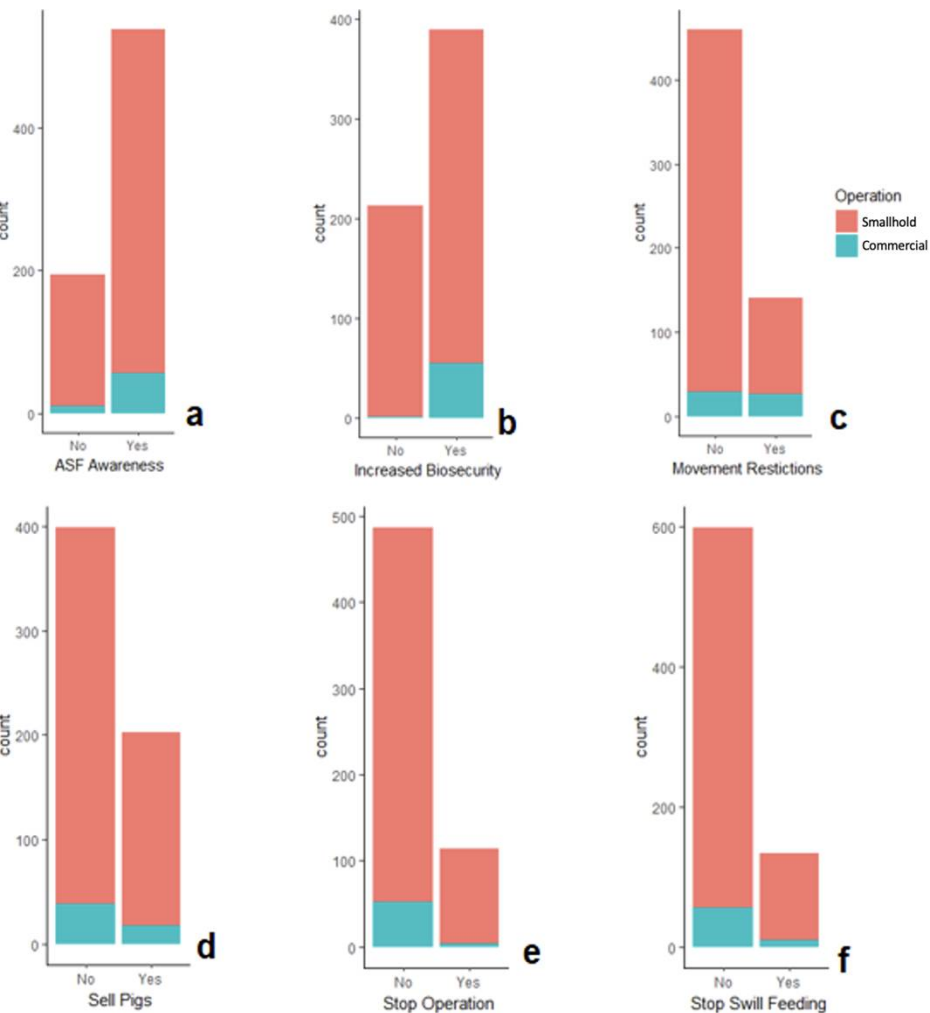


- **67% deal with pig agents.**
- **60% deal with swine traders**
- **24% allow the entry of the traders' trucks inside their farms.**
- **44% practice slaughtering the own pigs and selling pork. (small hold (92%).**





# Distribution: Actions in preparation to ASF outbreak



- 65% increased their biosecurity measures to prepare
- 24% restricted the movement of workers between pig buildings.
- 34% of sold their pigs as part of the preparation.
- 19% stopped their operations prior to the epidemic.
- 18% stopped feeding swill to their pigs.



# Identified risk factors associated with ASF disease spread

Category	Odds Ratio	P value	Probability
Backyard farming	3.850		
Allows customer inside			
Natural mating	2.480		
Slaughter and sell	2.400		
Entry of pig sales agent	2.350		
Water sourced from well or pump	2.310	0.003	0.310
Allows technicians inside	1.770	0.050	0.639

60% of the backyard farms are located to nearby piggeries  
 81% of farmers allow entry of fresh pork  
 59% allow entry of processed pork,  
 92% allows backyard slaughtering of pigs and neighborhood selling  
 and **swill feeding** is being practiced by 12% of the respondents.



**Identified protective factors that can be associated with ASF disease control.**

<b>Category</b>	<b>Odds Ratio</b>	<b>P value</b>	<b>Probability</b>
Change of footwear	0.570	0.040	0.3
Presence of laborer /workers	0.550	0.040	0.3
Bathing	0.540	0.039	0.3
Change clothes	0.500	0.014	0.3
Artificial insemination	0.460	0.007	0.3
Chlorinated water	0.450	0.008	0.6
Purchase of meat from supermarket	0.440	0.050	0.3



# LGU Regional scores

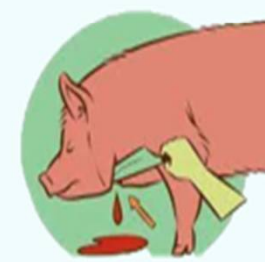
Region	Score
I	4.46
II	3.86
III	3.94
IV A	4.85
IV B	3.48
V	3.55
VI	5.61
VII	6.44
VIII	2.36
X	5.80
XI	4.50
XII	3.10
National	4.33
p-value	0.00025

- The obtained national average is 4.33 (range from 2.36 to 6.44). This is significantly lower (p-value<0.01) than the expected 5.0 average compliance scores of each region.
- The average scores speak of the preparedness of the LGU prior to the entry of ASF in their respective areas.

# Anthropological factors associated with ASF spread based on multivariate analysis.



Factors	OR	LL	UL	P-value
Selling pigs to agents	3.85	1.72	9.17	0.00149
LGU Technician/ Veterinarian as farm consultants	3.00	1.57	5.93	0.00114
Farm slaughtering & selling pork	2.86	1.37	6.26	0.00643
Allowing customers to enter the farm	2.65	1.43	4.98	0.00214



# SUMMARY

It has been established that ASF transmission occurs through **direct contact, swill feeding, and fomites.**

This study was able to determine **seven risk factors** associated in spread of ASF namely: (1) **smallhold farming**, (2) **allowing customer entry inside the farm**, (3) **natural mating**, (4) **backyard slaughter and selling to neighbors**, (5) **entry of pig sales agent inside the farms**, (6) **water sourced from well or pump**, and (7) **allowing entry of technician inside the farm.**



## SUMMARY 2

On the other hand, seven factors were also noted to have a bearing effect on the occurrence of ASF. Three out of seven factors for basic biosecurity practices namely: **(1) change of footwear, (2) change of shoes, and (3) change of clothes.** The other protective factors identified were: **(4) presence of laborers, (5) use of artificial insemination, (6) use of chlorinated water, and (7) purchase of meat from supermarkets.**





## SUMMARY 3

**Another key finding is the possible role of the slaughterhouse in the spread of the ASF disease.** *Instituting control strategies in all types of slaughterhouses including LRMEs could make a big difference in controlling the disease.*

**Issuances of shipping permits and health certificates** are some of the safeguards placed in our pork value chain to ensure that only healthy pigs will be slaughtered and eventually reach our plate. *However, document falsification does occur along the process of application and approval, thereby requiring the need to review and improve this process.*





## SUMMARY 4

**The role of the LGU is very important in managing disease outbreaks.**

*In this study, the limitations and areas for improvement of each representative LGU have been elucidated, thus making the gaps more visible for enhancement. Correcting these gaps could eventually lead to continuity in the chain of communication from the top national level, down to the barangay level.*



## SUMMARY 5

**The ASF national zoning and movement plan must also follow the four (4) pillars on disease control implemented during the FMD period:**

Vaccination, public awareness, disease monitoring and surveillance, and animal movement management. *Though vaccine is not yet available, strengthening the remaining three (3) pillars will be vital for the control of the disease.*



7<sup>TH</sup> PINOY PORK  
CHALLENGE

# SWINE INDUSTRY: PADAYON...PATULOY...BUMANGON!

## Thank You.

