

African Swine Fever Forum

Sharing what we learned at the APVS 2019

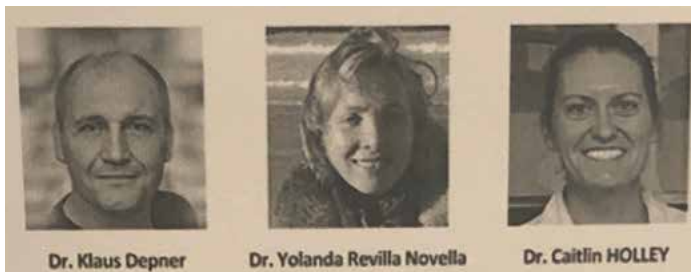
Dr. Zoilo M. Lapus

The Asian Pig Veterinary Congress 2019 was held in Seoul, South Korea last August 25-28, 2019. 39 Filipino veterinarians joined 764 delegates from other countries in the congress. While most of the attendees were Asians, the organizers invited notable experts from Europe and America to share their experiences in the prevention, mitigation, control and eradication of African Swine Fever. Originally planned to be held in Busan, the transfer was only decided in the last 2 months and was necessary because of an ASF outbreak in North Korea. Many registrants backed out or refused entry as they would come directly from other ASF affected countries notably China, Vietnam, Cambodia, and Laos. We flew to Seoul amid the news of dying pigs in Rodriguez and Antipolo Rizal.

Being a member of the APVS Board of Directors, our pre-congress meeting focused on the status and planned actions/reactions to ASF infection. We centered our discussion to the reports of China, Vietnam, Cambodia and Laos being the countries affected during that time. All these countries reported culling millions of pigs due to ASF. Since ASF is a transboundary disease, checkpoints were established immediately and disinfected facilities, trucks and equipment. Centralized kitchens were put up in farming communities to cook swill or kitchen scraps before distributing them to backyard swine farmers particularly in Vietnam. Strict farm biosecurity protocols were implemented. Dr. Qigai He from China mentioned doing necropsy on pigs when they are already in the burial pit lined with plastic sheets to avoid spilling blood on the ground that would eventually affect the water table. Dr. He said they paid specific attention to the very large hemorrhagic spleen of a pig with ASF. They collected whole blood, lymphatic fluids and other tissues for PCR from each pig and culling all of those testing positive. If the farm mortality subsides in 3 months, the farm is allowed to re-populate with 1-2 sentinel pigs per pen. PCR is done on the sentinels every 1-2 weeks for the next 1-2 months. If the sentinels tested negative, they declare the farm clear of ASF. The same protocol is done by other affected countries.

ASF FORUM

The organizers dedicated the last day to an ASF forum. Unlike previous conventions, it was a well-attended closing day. The ASF problem in Asia was real and threatening the availability of pork in the dinner table. The forum highlighted the presentations of Drs. Klaus Depner of Germany, Yolanda Revilla Novella from Spain and Caitlin Holley representing the OIE.



TEXTBOOKS ARE WRONG ON ASF

Dr. Depner presented the topic on understanding ASF and major challenges to control the disease. He started by describing a domestic pig with ASFV developing a severe

hemorrhagic disease ending in death within a couple days (Plowright,1994). If the diseased pigs or its secretions come into contact with other pigs, most of these will become infected and meet the same destiny (Taylor, 2006). Thus, he worked on the hypotheses that ASF will fade out rapidly due to high mortality and that it will spread rapidly initiating an epidemic wave. However, later years revealed that both hypotheses were wrong. There was no implosion nor explosion. ASF turned out to be endemic in the region that spread slowly.



Dr. Depner showed a domestic cycle for ASF stressing the recent infection of pigs by contaminated products. He cited the less efficient virus transmission through oral infection. He noted that a direct oral transmission between domestic pigs in the absence of ticks are “atypical transmission”.

Contagiosity depends on virus dose, infectious material, the animal behavior and its management. The ASF virus is relatively stable. ASFV stays indefinitely in frozen meat and almost one year in dry meat and fat. It stays more than 3 months in blood, offal and salted meat with over one week in feces. Dr. Depner emphasized that ASFV survives the process of putrefaction and carcasses may remain infectious for weeks. However, the survival duration of ASF virus in any material is decreased by temperature.

In the blood fraction, 90% of ASFV is associated with erythrocytes (Wardley et al, 1977). It is wrapped safely into erythrocyte membranes (Bastos et al, 2003, Gallardo et al 2009). The estimated life span of porcine erythrocyte is about 65 to 85 days (Liebich,2003). Thus, clearance of the virus may take up to 3 months.



Dr. Depner noted that the percentage of animals which get infected after contact with a pathogen is around 10-30%. It is not an indicator for disease severity and impact. With his new findings, later years showed that what the textbooks say about ASF were wrong! The latest key epidemiological characteristic of ASFV are:

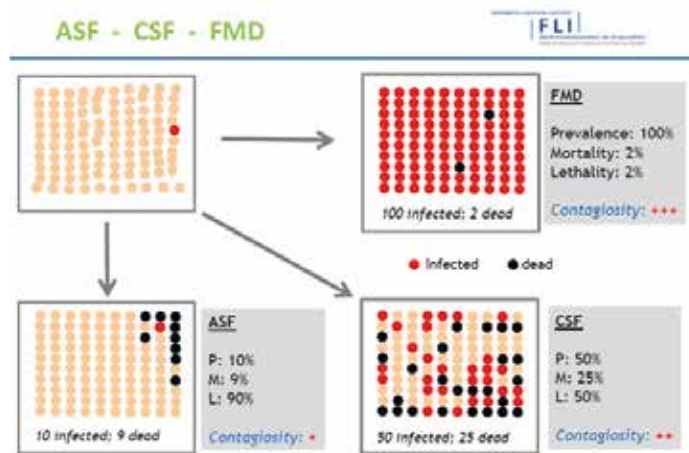
1. ASF in the field is not highly contagious but with high case fatality (>90%), low initial mortality (<5%), low prevalence (<5%) and not necessarily a density dependent process.
2. ASF is slow spreading with side fidelity (habitat disease)

- Survivors are not necessarily carriers and carriers are not shedders. There is no epidemiological relevance in an epidemic without tick involvement.
- Mild strains are disadvantaged due to the low case fatality; only indirect transmission via ticks would facilitate virus survival.
- Early detection is only by passive surveillance.

Despite what the textbooks say, ASF is not a highly contagious disease – BUT it is highly lethal

The qualities of three epidemiological traits make ASFV efficient in persistence and transmission. These are: 1) its low contagiousity which prevents fast and complete depletion of the host population 2) high case fatality that makes the virus largely available in the form of carcasses and 3) high tenacity ensuring long term virus persistence in the environment. The interaction of these three parameters maximize local persistence and limits geographical spread.

In passive surveillance, the probability of detecting ASF is higher in sick or dead animals than in randomly sampled healthy ones. The findings are a staggering almost 80% positive cases in wild boars found dead compared to less than 2% in active or hunted.



Comparing ASF to Foot and Mouth Disease and Classical Swine Fever or Hog Cholera, Dr. Depner showed the high contagiousity in FMD with very low mortality and CSF with moderate contagiousity and lethality as well. ASF has low contagiousity but very high lethality.

The PCSP is thankful to Dr. Klaus Depner for sharing his knowledge and presentation slides with us.

VACCINATION – STILL LOOKING

Dr. Yolanda Sevilla in her presentation related how Spain eradicated ASF after 30 years (1960-1990). She said that producing ASFV vaccines are feasible but not easy. The complexity of the virus makes it difficult to develop a potent vaccine. Initially, she tested inactivated, sub-unit, and DNA based vaccines. All her attempts failed to confer full protection against lethal viral challenge. Using live attenuated vaccines conferred full protection against homologous and heterologous challenge, but side effects and safety concerns are serious issues.

In a related note, Dr. Depner also mentions that it is not only having an ASF vaccine but also having a good vaccination strategy that will determine successful disease control. He quotes the OIE –“Thus the decision whether to recommend vaccination as a part of animal disease control strategy

requires a thorough knowledge of the characteristics of the disease agent and its epidemiology as well as the characteristics of the vaccines.”

BIOSECURITY – THE ONLY TOOL

This is the most effective and only potent tool to date if we are to control the ASF virus. Dr. Depner recounts that there were outbreak cases where some farms have been able to evade infection by just doing three simple biosecurity rules namely 1) No swill feeding 2) No contact with strangers 3) Change boots before entering the farm.

Since ASF is stable in domestic pigs. The successful approach entails the following measures: Standstill; Culling and; Cleaning and disinfection. In areas with wild boars wherein it's virtually stable in the forest, measures taken should be: Standstill (no disturbance of wild boars, no hunting, provision of electrical fence; No trapping and; Proper disposal of carcasses. Thankfully, the Philippines has no report of the ticks present in our wild pigs.

Dr. Caitlin Holley of the OIE also shares what the Biosecurity recommendations are in Europe (based on SFE GFTADS Europe – SGE ASF 2), here are some of the more applicable ones for us in the Philippines:

- No swill feeding;
- Pigs should be introduced from trusted and certified sources;
- Visitors should be discouraged to enter the pig farms;
- Personnel should be well-trained/informed and contact with other pigs or wild boar forbidden;
- Perimeter fencing preventing contact with feral pigs (double fences) should be installed;
- Carcasses, discarded parts from slaughtered pigs and food waste should be disposed of in an appropriate manner;
- Sharing of equipment and tools between the holding should be avoided;
- Appropriate means for cleaning and disinfection have to be placed at the entrance of the farm buildings. Effective disinfectants shall be available in the holding;
- Vehicles and equipment should be properly cleaned and disinfected before entering into contact with pigs and leaving the holdings;
- Proper hygiene should be done before coming in contact with pigs.

ASF – A HUMAN DRIVEN DISEASE!

Dr. Holley emphasized, humans are the main cause of long distance transmission and virus introduction into pig farms. Thus, it is crucial to include social science when planning prevention, control or eradication measures. By considering only the biological characteristics of the disease, BUT ignoring the social aspects, the epidemic will not be controlled. Her final slide lists the following key messages:

- We need to:
- Understand pig value chains
 - Have good passive surveillance systems to early detect the virus
 - Rapid response with effective quarantine and biosecurity measures
 - Reduce viral load
 - Work together!!!

Finally, any plans to control ASF will only be successful if all farms, authorities, veterinarians and media will cooperate and act as ONE.