FAO Regional Office for Asia and the Pacific
Animal Production and Health Commission for Asia and the Pacific

Emergency Workshop on Porcine Respiratory and Reproductive Syndrome (PRRS) - Summary

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Executive Summary of Recommendations

1. Endorse the Vietnamese plan regarding the "new" PRRS response and support to the extent that funding permits:

   - Differentiation of the two PRRS antigens.
   - Demonstration of Koch's postulates for "New" PRRS and description of the post mortem lesions.
   - Demonstration if viral cross protection is evident.
   - Development of serum antibody tests for "New" PRRS.
   - Development of a PCR or other antigen demonstration technique for "New" PRRS.
   - A serological survey of the "New" PRRS prevalence in both village and commercial systems.
   - A study of market chains in the Vietnamese production system to target vaccine or other disease responses including communication measures.

2. Develop a network of decentralized laboratories for the South East Asian region with increased swine disease capacity that:

   - Is underpinned by a reference laboratory,
   - Cooperates to ensure standardization of methods, reagents, results and
   - Can cover the expected range of transboundary and other swine diseases.

   The infrastructure is already in place through the Avian Influenza control program but the skill base and swine disease diagnostic capacity and coordination can be developed much further.

3. Develop a capacity building program in the diagnosis and investigation of swine diseases starting with surveillance programs for common transboundary and other swine diseases and professional development for government and private sector veterinarians.

4. Funding support for these elements should be sought from donors.

A Suspected New Disease in Asia

1. The workshop considered the emergence of a suspected highly pathogenic strain of PRRS in Vietnam and discussed how to respond to this and other diseases that might be encountered in the region according to the terms of reference.

2. Background papers were provided by each of the delegates. The workshop was strongly influenced by the disease situation in Vietnam as reported by Dr Nguyen Van Long and Dr Vincent Martin, FAO, Beijing.

3. Information regarding the PRRS isolate is not yet complete. The Chinese regard it as a different strain but it is still possible that the disease observed is PRRS virus together with CSF virus or PCV2 or another agent hitherto unrecognized.

4. Early reports from USDA (NADC Ames) indicate that the Vietnamese PRRS isolate has 98% homology with existing strains but that in SPF pigs it is highly pathogenic. The lesions following challenge by the Vietnam isolate have not been reported. It is not known yet if they resemble the post mortem signs seen in Vietnam. The post mortem lesions and clinical signs described by Dr Long are more indicative, at least to the author, of CSF than PRRS. No strain of PRRS recovered until now has been linked to the lesions described by Dr Long.

5. While other countries (Philippines, Thailand) had detected PRRS before none have diagnosed the same virulent disease syndrome reported in Vietnam. In Laos, Myanmar and Cambodia, in particular, laboratory diagnostic support across a range of pig diseases is not available but across all the countries high level laboratory capability presented challenges. In Laos a disease killing pigs in the north of the country has been reported. The disease appears NOT to be CSF.

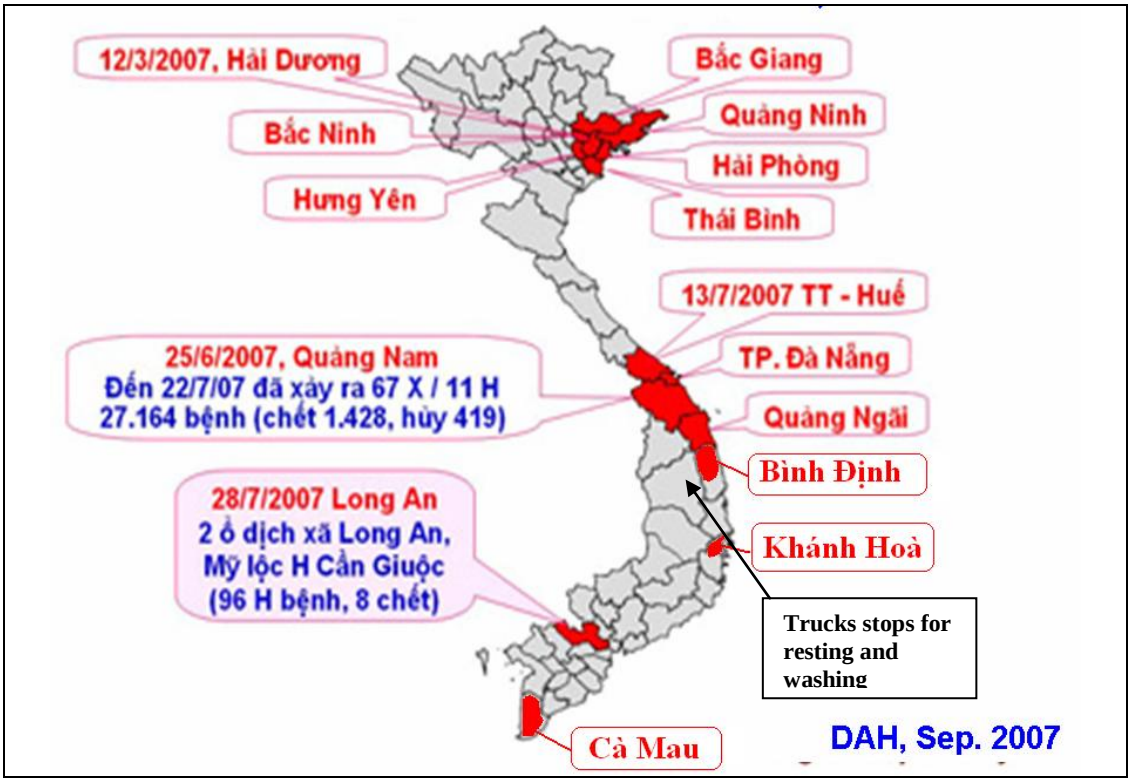
6. In Vietnam the new disease was confined to smallholder and village farms. It had not reached the commercial sector. I n China the disease has affected all levels of pig farming.

7. The disease was thought to have entered Vietnam through illegal imports of pigs smuggled from China for sale in local markets for immediate slaughter. The meat was sold to villagers who took it home and fed the waste pork to their own village pigs. The disease then spread to central and southern provinces with pig movements (Fig one). The central province acts as a resting and unloading point for pigs transported from the north. Mixing with local pigs can occur.

8. The exposure of Chinese pigs directly to the Vietnamese village pigs or via village or market pigs in direct contact was not reported.

9. Vietnamese village farmers source breeding stock as mature animals or piglets from larger medium size producers but these were not implicated in the PRRS disease spread. They sell pigs to markets, but, unlike Lao PDR for example, do not buy pigs from them to grow out. Village farmers or small holders who keep sows may sell pigs to other small holders or villagers who grow them out. In a village system one family may own a boar, which is rented out to other villagers for a fee.

Figure 1: PRRS infected provinces in Vietnam (in red). Southern movement of pigs



Source: Dr Nguyen Van Long

10. In Vietnam regulatory authorities closed the borders of affected provinces for 30 days and slaughtered out affected herds. No movement outside the province was permitted. Compensation to 40% of a pig's value was paid.

- No commercial farms were involved in the two waves of disease seen in March and July 2007.
- The third wave, if it is going to occur, will likely occur in November (to allow for one pregnancy cycle) through to February to coincide with the Tet festival and the Vietnamese new year when pigs are likely to be moving again.
- Some farmers treated their pigs with antibiotics. This diminished the impact of secondary bacterial infection and enabled the pigs to survive.

- A national survey for PRRS was conducted. About 10% of the herds were positive for PRRS antibodies. However, even in herds that were vaccinated against PRRS virus serious disease occurred so it would appear that circulating PRRS antibody is not protective – or the disease is not caused by a PRRS virus.

11. The Chinese have reportedly developed a killed vaccine that is protective in the laboratory.

12. If the new virus is as pathogenic as claimed then methods developed in other parts of the world based on exposure of replacement breeding stock and herd closure (Desrosiers and Boutin, 2002) will not work because the virus will kill exposed breeding stock.

13. Vietnam expressed a preference to fast track laboratory and field trials with a killed vaccine developed in China. They noted that veterinary opinion on Avian Influenza vaccination was divided until Vietnam vigorously pursued it to useful effect. Vietnam noted that for their small holders they had nothing more to offer. The workshop noted that repeated disease outbreaks and responses that entailed punishing regulatory constraints and compensation at less than 50% of market value was unsustainable politically, economically and it terms of disease control principles. Any national or regional disease control response requires:

    - Disciplined farmers who avoid the pressure to panic sell in the face of disease
    - A system of disease reporting
    - A diagnosis confirmed by laboratory testing .
    - A survey of prevalence of clinical disease, presence of antibody or antigen.
    - A communication strategy about disease prevention and especially biosecurity.
    - Skilled veterinary and paraveterinary staff.
    - A reaction team trained in disease response and a documented disease response procedure.
    - A supporting regulatory environment that includes the capacity to stop movement and provide compensation if only to permit sampling of suspect cases for diagnostics.
    - A response plan that does not cripple an industry in the longer term.
    - A complete understanding of the local industry.

14. Vietnam intended to test the vaccine in the laboratory. Field trials would follow if the laboratory trials were promising. If the field trials worked then vaccine would be made available for sale and regulatory controls removed.

15. In support of the vaccine trials a serological survey would be used to identify high-risk farms and to demonstrate infection distribution and prevalence.

16. "New" PRRS virus antigen tests would further refine diagnosis.

17. Together these elements would underpin an extension program targeting small holders and the veterinary network. Separate programs are required because villagers and small holders do not engage veterinarians.

18. Any extension program must engage the market segments – commercial, small holders and village systems.

19. Before these elements can be implemented a Research and Development program must be implemented. The purpose of the R&D program is to:

    - Differentiate the two PRRS antigens.
    - Demonstrate Koch's postulates for "New" PRRS.
    - Demonstrate if viral cross protection is evident.
    - Develop serum antibody tests for "New" PRRS.
    - Develop a PCR or other antigen demonstration technique for "New" PRRS.
    - Serologically survey the "New" PRRS prevalence in both village and commercial systems.
    - Study market chains to target vaccine efficacy.

20. In the medium term, and until a vaccine can be developed, control of the disease and prevention of its introduction rests with sound biosecurity. The key elements of any biosecurity program are:

    - Closed herds or single source supply and quarantine of new introductions
    - Semen introduced from known negative sources
    - No feeding fresh pig meat or products to pigs
    - Control of visitors and basic commonsense hygiene.

21. A biosecurity training program targets farmers and veterinarians. It also involves regular farm participation in disease investigation. It is a key element of animal health capacity building.

22. In village production systems the purchase of pigs from regional, district or local markets and introducing them to pens of village pigs must be avoided.

23. A major risk for Vietnam is that if the disease penetrates the commercial sector and the current punitive regulatory disease control impositions are maintained nobody will invest in pig production and Vietnam will be unable to meet its target of a six percent growth in output. Accordingly Vietnam must soften its disease control policy to enable producers in infected provinces to sell their pigs for slaughter.

24. With respect to PRRS virus existing technologies enable the disease to be controlled. The best success is likely to be found with herd closure for six months immediately following infection, stocking with sufficient replacement stock to last six months, testing the herd with sentinel animas to check for continuing viral excretion and then introduction of seronegative replacement stock via a quarantine facility. This method has been found to be successful in Europe and North America. It works best in a facility where the sows and young pigs are housed on a separate site to the growing herd. Once the herd is seronegative a sound biosecurity plan will keep it negative. This includes serologically testing boars and gilts into a quarantine facility and again into the main farm. I t also includes buying in semen only from seronegative accredited PRRS free herds.

25. An alternative option for positive herds is to stabilize infection in replacement breeding stock either by using vaccination or by exposing young gilts to the herd virus then allowing four months for them to recover and cease shedding virus before breeding. In this case it is necessary to match the vaccine used on the farm to the PRRS isolate.

26. The problems faced with the “new” PRRS virus and the disease it is causing highlight a regional problem with respect to investigating swine disease.

27. As the prosperity of the region grows pig numbers will increase to meet consumer demand for pork. This trend is evident in Vietnam where pork consumption has increased by 150% to about 20 Kg per person in ten years. The increased production is coming from an increase in herd size. Any herd size increase is driven by an increase in gilt numbers. Vietnam is already one of the top ten pork producers in the world and plans a further six percent increase in output. Thailand is also a significant pork producer.

    In addition, as systems modernize, successful pork production is driven by genetic improvement and this means that 40% o the herd will be replaced annually. Further, as herd size increases, culling rates will increase to 45-50% and this will mean that breeding herd age will decrease. As more and more gilts and young sows populate herds the disease risk from these young animals increases.

    Further as the demand for genetically superior replacement breeding stock increases it is likely that the structure of the industry will follow western models and specialist breeding companies selling replacement breeding stock will emerge. Hence the problem of a young herd and endemic disease will be compounded by increasing movement of animals and the risk of introduction of new diseases to Vietnamese and Thai herds. A structure of this kind demands increasingly sophisticated veterinary diagnostic capability.

    A decentralized laboratory network for swine diseases

28. The experience with Avian Influenza diagnostic capability has demonstrated the value of a network of decentralized laboratories underpinned by a

reference laboratory and cooperating to ensure standardization of methods, reagents and results. The network is inked by a country offering coordination services.

- In this system countries cooperate to the level of their capacity.
- Some assume greater responsibility by offering a reference laboratory but these facilities are very expensive and demanding to operate.
- In the case of a swine diseases laboratory network some laboratories will offer specialized services. For example Vietnam is the regional reference laboratory for CSF supported by the Australian Animal Health Laboratory in Geelong. For this laboratory to work properly it is necessary that it be given the opportunity to further develop expertise through regional laboratories forwarding samples preferentially there rather than direct to AAHL, Pirbright, Institute Pasteur or Plum Island.

29. A decentralized laboratory network builds local capacity in swine diagnostics and swine disease control. The network permits the development of a system where swine specialist clinicians and epidemiologists can work from these centres. They further encourage exchanges and technical interactions and opportunities for visiting specialists. The laboratories can form linkages with local or international institutes, universities or laboratories. Importantly the laboratory network enables a rapid response in the face of existing an emerging disease threats. For example in the last twenty years PRRS, Menangle virus, Nipah Virus, Porcine Circovirus type 2 and Porcine myocarditis virus (a pestivirus) have all been identified.

30. The laboratory network also permits a heightened level of animal health extension. It permits different stakeholder groups to be targeted because it is drawing on local people who understand the groups, the industry dynamics and the information offered is local and relevant.

Disease Response Preparedness

31. Disease response preparedness was discussed by the delegates:

- In the first instance there needs to be a documented response plan.
- The plan needs to be underpinned by government regulation and have industry support. Rapid cessation of movements, imposition of quarantine and compensation are key early elements.
- Any response starts with an early diagnosis that is confirmed by laboratory testing.
- The type of disease control response is based on an understanding of the prevalence of the disease. This is best based on serological survey or antigen monitoring.
- The disease response program first targets high-risk farms and areas. High risk farms are identified by trace-back and trace-forward and serological surveys.
- A thorough communication program targeting farmers, veterinarians and the community is an integral element.
- Skilled and trained staff must be available in both government and private sectors to implement any response.

32. The main gaps in the region with respect to swine disease control preparedness lie with laboratory capability and staff skilled in swine diseases.

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