Development of Diagnostic Test Kits for Swine Gastrointestinal Diseases

Swine is the Philippine’s largest animal industry in terms of volume and value of production. In 2009, the industry produced a total 1.88M mt of live weight, valued at ₱107.60B. More than its direct contribution, the industry also supports other allied industries such as feed milling, veterinary drug trading and distribution, meat processing, etc. that are also significant contributors to the country’s economy as they are also creating employment for Filipinos of various levels of skills and expertise. The sector remains the second leading contributor to the entire gross value of Philippine agriculture for the year, accounting for 13.56 per cent of the total. Most importantly, the swine industry is a major factor in ensuring the country’s food security since pork comprises about 60% of the total animal meat consumption of Filipinos.

About 71 percent of the swine population in the country is raised in backyard farms while 29 percent is in commercial farms. The country’s swine inventory as of January 2010 was estimated at 13.4 million head. This was 1.46 percent lower compared to last year’s inventory of 13.6 million head. The beginning stocks in backyard farms went down by 0.63 percent and those in commercial farms dropped by 3.46 percent against the 2009 levels. Reports showed that the January 1, 2010 total inventory of gilts, fatteners, growers, piglets, weanlings and boars went down from the 2009 level. On the other hand, only the sow total inventory was higher than the 2009 level.

In 2010, around 64 percent of the total swine population were concentrated in top 5 regions namely: CALABARZON with 13.13% share; followed by Western Visayas with 11.56% share; Central Luzon, 10.66%; Eastern Visayas with 7.84% and Central Luzon, 7.30%. Region VI ranked first in backyard inventory with 14 percent while Region IV-A ranked first in commercial inventory with 33 percent.

The swine industry is still beset by two important problems that need government R&D intervention and support. One of the two major problems of the industry is escalating feed prices. According to the Bureau of Agricultural Statistics, Filipinos consume about 17 kg of pork per capita, equivalent to 65% of the total annual meat consumption. With pork prices rapidly increasing from P140/kg to P180/kg in over a week’s time, many Filipinos have to resort to other meat sources. Because of this, small swine raisers and employees of small commercial swine farms are losing jobs and sources of income.

Another major problem is disease, which accounts for about 20% loss in the value of swine production. Moreover, a 5% increase in production cost can be attributed to expenses on drugs and other medicaments to ensure optimum survival rate and productivity of pigs. Small-scale breeders or backyard raisers dominate the Philippine swine industry. The current pork crisis, however, is pushing these small players to close shop as they lack the capability to implement reliable farm biosecurity measures.

Disease outbreaks that hit major swine production provinces, which supply more than 50% of the pork demand in Metro Manila and nearby cities, took a heavy toll on the local swine and allied industries. One of the most critical disease problems of the local swine industry is gastrointestinal disorder or enteric disease among pigs of all ages.

Whenever pig farms are hit by a disease outbreak, pork supply will remain tight for the first four months of the following year because the farms are still recovering. This is the reason why, despite of an improving output of the Philippines hog industry, the country continues to experience a tight supply of pork meat. Hence, there is a need to improve surveillance of possible emerging and re-emerging diseases in the region.

Diarrhea in growing pigs is a major cause of financial loss to pig farmers and can lead to delays of 14 - 21 days in pigs reaching finishing weight. There are many causes of gastrointestinal diseases in pigs from suckling to finishing. However the common endemic infections are recognized as having the most significant economic impact on farms as they affect successive batches of pigs and their subclinical influence extends well beyond the obvious clinical effects observed by the farmer and his veterinarian. Mixed infections involving two or more pathogens are common.
and result in more severe enteric pathology, poorer growth rates and lower economic returns. Dual infections might not be susceptible to the same antimicrobial agents leading to difficulties with the therapeutic management of disease outbreaks.

In the Philippines, diseases like Porcine Reproductive and Respiratory Syndrome (PRRS), Porcine Epidemic Diarrhea (PED), and Transmissible Gastro Enteritis (TGE) affected practically all classes of pigs, including breeder stocks. These diseases have caused high rates of morbidities and mortalities, and triggered tremendous losses in slaughter pig production. Unfortunately, small scale hog raisers have limited access to veterinary services and well equipped laboratories managed by competent personnel that can provide prompt and definitive diagnosis (e.g. ELISA, PCR, electron microscopy) of animal diseases.

It is important to establish which pigs or stages of production are affected and approximately what proportion of pigs have diarrhea. This can be a difficult where pigs are housed in large groups on slatted floor or in a deep-straw system. Examination of the dunging areas should provide evidence of the type of diarrhea (pasty, watery, bloody, mucus) but finding typically affected pigs can be difficult. Pre-identification of affected pigs by farm staff in advance of the veterinarian arriving increases the rate of diagnostic success considerably. Pigs are less likely to show clinical signs when disturbed by unfamiliar people entering the pens. Pre identification of potentially infected pigs would facilitate examination and testing for the disease.

A solution to address the chain of problems confronting the swine industry is for the government to initiate the development and implementation of an efficient and effective disease monitoring and surveillance system that is armed with functional and reliable diagnostic laboratories. The contribution of the S&T sector could be in the development of novel quick, reliable and cost efficient disease diagnostic protocols and kits that would be useful to swine raisers and local diagnostic laboratories in the detection and control of swine diseases.

Surveillance studies that provide national incidence or prevalence data on causes of infectious diarrhea are valuable to field veterinarians. These data provide information on changes in prevalence that might occur naturally in response to local or national disease control polices. Prompt and reliable disease diagnosis would be doubly important for a swine industry with more than 70% of its pig population inventory is in backyard farms.

Minimizing economic losses due to infectious diseases is of utmost importance to the swine industry hence, there is a need to develop a fast and reliable diagnostic method that will specifically detect the presence or absence of the suspected pathogen at an early stage of infection, in order to limit the spread of the disease within or in areas surrounding the farm.

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College of Veterinary Science and Medicine of CLSU