

Areerat Pangpeng 2012: Development of Nucleoprotein ELISA to Monitor Swine Influenza Virus Infection in Thailand. Master of Science (Veterinary Microbiology), Major Field: Veterinary Microbiology, Department of Veterinary Microbiology and Immunology. Thesis Advisor: Associate Professor Porn Tippa Lekcharoensuk, Ph.D. 131 pages.

Swine influenza virus (SIV) is caused by influenza A virus while swine is a genetic-mixing vessel for human and avian influenza viruses. Thus, surveillance of SIV in swine is crucial for prevention and control of influenza A viruses. Nucleoprotein (NP) is a group specific antigen for all subtypes of influenza A viruses. The objective of this study was to develop NP ELISA to investigate the SIV infection in Thailand. Recombinant NP was produced in *E. coli* which was cultured at 37°C for 16-18 hours with 0.2 mM IPTG induction. The recombinant NP had a molecular weight of 56 kDa and reacted specifically with antibodies to histidine tag and the SIV convalescent swine sera. The soluble form of NP was purified by using affinity chromatography and the protein was used as antigen for NP ELISA. Swine sera were classified as positive and negative using IFA and used for cutoff setting. The cutoff of NP ELISA was determined using receiver operating characteristic (ROC) analysis. Comparison of results between NP ELISA and IFA revealed an acceptable agreement of tests with the kappa value equal 0.568 ($p < 0.01$). In addition, diagnostic sensitivity and specificity of NP ELISA were 93.4 and 80%, respectively. NP ELISA was used to examine SIV infection from 1,548 sow-serum samples collected from farms in five provinces located in different parts of Thailand during 2009-2010. The results showed that antibodies to SIV were detected in 96.88, 94.52, 93.90, 93.27 and 89.92% of sows from Northeast, Central, East, South and North of Thailand, respectively. The ratios of SIV infection among pigs from different parts of Thailand were not significantly different. In conclusion, sows in the south Thailand appeared to have the highest level of antibodies to SIV in May while more anti-SIV was found in sows from the other parts of Thailand in July. Both months are at the beginning of the rainy season in Thailand that provides the environment for contact transmission of SIV. This mode of transmission is the most suitable mean for influenza A virus spreading in tropical countries.

Student's signature

Thesis Advisor's signature