



CHAPTER I

INTRODUCTION

Porcine epidemic diarrhea virus (PEDV) is a member of family coronaviridae. PEDV infection is a cause of acute watery diarrhea, vomiting and severe dehydration in pigs of all ages (Pensaert, 1984; Pospischil et al., 2002). These severe symptoms lead to metabolic acidosis, causing of piglet death (Pospischil et al., 2002; Pensaert and Yeo, 2006). At the first outbreak of PED negative swine herds, piglets age less than 7 days old always die with high mortality rate up to 100%, but the older pigs could recover within 1 week (Pensaert and Yeo, 2006; Olanratmanee et al., 2010; Saif et al., 2012). The outbreak of PEDV infection causes serious economic loss in worldwide swine industry because high mortality rate of suckling piglets has been found approximately up to 30-100% (Pensaert and Yeo, 2006).

The first discovery of PEDV infection was reported in 1971 in England (Pensaert and Yeo, 2006). Subsequently, the disease was continuously devastating the production in several pig herds in Belgium, Switzerland, Germany, France, The Netherlands, and Bulgaria (Pensaert and Yeo, 2006). In Asia, the PEDV outbreaks were reported in Japan (1982) (Kubota et al., 1999), China (1986) (Chen et al., 2008), Korea (1993) (Lee and Yeo, 2003), Thailand (1995) (Srinuntapunt et al., 1995), and India (2003) (Pensaert and Yeo, 2006). Then PEDV is considered as an endemic pathogen in South East Asia (Pensaert and Yeo, 2006). Nowadays, PED is one of the most serious enteropathogenic diseases that had economic impacts to swine industry worldwide. However, disease prevention and control programs for this disease have not been much successful results.

In Thailand, PEDV had been circulated in swine herds since 1990s; the first PEDV identification by FA technique was reported in 1995 (Srinuntapunt et al., 1995). In 1997, PEDV was successfully cultured in vero cell line by Antarasena et al. (1997). In 2004, PEDV strain M_NIAH/04 was isolated by Thanawongnuwech (unpublished data). In 2008, PEDV isolates were achieved and reported those data in complete M gene sequences by Department of Livestock Development, National Institute of Animal Health,

Thailand (NCBI database). PEDV infection had been found and became more deleterious during late year of 2007 to 2008. A well-described disease characteristics of Thai PED situation based on molecular epidemiology was first published by Puranaveja and colleagues in 2009. Later, the PEDV remained circulating in several commercial swine herds, especially in the pig farm with poor biosecurity and led to serious piglet losses until present day. Although several PEDV immunization techniques *i.e.* oral inoculation with infected sow feces, minced intestine of infected piglet, or PED attenuated vaccine are being used, the outcomes are varied from farms to farms. Furthermore limited information of PEDV molecular epidemiology is available since 2009 (Puranaveja et al., 2009). It is important to understand where the disease came from and how the disease occurs in the herds in order to plan the prevention and control program. At the present, the outbreaks of PEDV in Thailand still continuously occurred. Interestingly, several farms have re-occurring of PEDV infection many times in one year. Therefore, the further studies on PEDV molecular characterization are required to conduct for better understanding of PEDV re-occurring and genetic variation among Thai PEDV isolates.

Objectives of Study

The recent Thai PEDV isolates during 2011-2012 were conducted to continuously investigate the molecular epidemiology by genetic comparison based on spike (S) and nucleocapsid (N) gene sequences to previous report database and the reference strains of PEDV.