Vaccination for Control of Foot-and-Mouth Disease in the DPR. Korea

Hong Thae Sik

Biological Product Research Institution (BPRI), Ministry of Agriculture, DPR. Korea.

Introduction

During the past few years, the world has witnessed a global re-emergence of dangerous diseases like food and mouth disease (FMD) that have had, and are still having, significant impact on both the social and economy. The outbreaks of FMD were recorded two times (2007 and 2010) in the DPR. Korea since 2000. Whenever FMD was occurred, emergency state was declared. Although FMD was occurred in many farms in all of the country from December 2010 to March 2011, dissemination of FMD has been able to stopped by veterinary anti-epidemic measures including enhancing of border inspection, quarantine, animal movement restriction, biosecurity, culling, isolation and treatment for secondary infections of animals suffered from FMD, traffic blocking, disinfection and surveillance were implemented without vaccination.

It was decided to vaccinate for all susceptible animals under the emergency assistance of FAO to decrease economic losses and not to re-infect. Animals was vaccinated binary vaccine (O and Asia-1) in 2007 and O serotype vaccine in 2011. Vaccination was carried out in late autumn once a year because FMD was only occurred in winter and spring in the DPR. Korea.

After vaccination, it was performed surveillance for FMD, which was not found and re-occurred.

Materials and methods

The vaccine trail aimed at assessing the efficacy of vaccine. Cattle, pigs, goat and sheep were vaccinated for vaccine trail. The vaccination campaign was realized in pilot in one province (South Phyongan province) for obtaining experience in vaccine and instrument distribution, vaccination organization. Lessons learn from the pilot vaccination campaign were diffused to the entire country.

The main vaccination campaign was simultaneously carried out in the whole country at a time. Post vaccination surveillance consisted of sero-surveillance by LPB-ELISA and NT to evaluate the vaccination efficacy and viro-surveillance by RT-PCR and gold immunochromatographic strip test to detect FMD virus.
Result
90% of cattle, goat and sheep but 80% of pigs inoculated O and Aisla-1 serotype binary vaccine were seropositive at one month after vaccination in 2007. Additionally, 95% of cattle, goat and sheep but 85% of pigs inoculated O serotype vaccine were seropositive at one month after vaccination in 2011. 15 to 20 days after vaccination, some animals were suspected or infected as FMD positive animals by RT-PCR(0.6%), gold immunochromatographic strip test(1.2%) and NSP-ELISA(7.8%) in farms affected by FMD. 3 months after vaccination, suspected animals in farms affected by FMD were not detected. In pilot vaccination campaign, more than 90% of animals were seropositive and in the main vaccination campaign more than 85% of animals were seropositive. The suspected animals were not found in surveillance for all susceptible domestic animals vaccinated for 3 years after outbreak of FMD

Discussion
Its most dramatic effects are observed in previously virus-free areas where it rapidly spreads through fully susceptible animal populations and causes significant financial losses. There are direct losses due to deaths in young animals, loss of milk, loss of meat and a decrease in productive performance. The costs due to eradication or control are high, and there are major indirect losses due to imposition of trade restriction. A large variety of animals including cattle, swine and sheep are susceptible to the FMDV and was economically very important. Therefore, it is difficult to adopting slaughtering policy in large scale for control of FMD. Not only to decrease economic losses but also to prevent FMD, vaccination for all susceptible animals was performed. The trail of the vaccine showed that immune efficacy by univalent vaccine was higher than bivalent vaccine. Additionally, immunogenicity of vaccine for herbivorous animals like cattle, goat and sheep was likely higher than it for omnivorous animals like pigs. 15-20 days after vaccination, some animals infected and suspected FMD were remained and therefore, it was indicated whether vaccinated animals had low immune response in early of vaccination or normal matching vaccine was used. After vaccination for all susceptible animals, the infected and suspected animals were not found in surveillance for 3 years and FMD was able to control.
**Biography:**  Hong Thae Sik, PHD., Prof.

Dr. Hong Thae Sik is a head of animal cell culture laboratory, a director of the virus disease research division, Biological Product Research Institution (BPRI), Ministry of Agriculture, DPR. Korea.

He obtained PhD at BPI on “Study on the establishment of production method of serum-free culture medium” in 2005.

He had been engaged to research for epidemiology and prevention of the disease such as FMD, AIV and animal virus diseases.

He is a member of the DPR. Korea Veterinary Scientific Commission since 2007.