RAPID AND ACCURATE DIAGNOSIS OF HIGHLY PATHOGENIC AVIAN INFLUENZA (H5N8) VIRUS USED FOR THE CONTROL OF THE OUTBREAK IN THE REPUBLIC OF KOREA

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In the Republic of Korea, a suspect case of highly pathogenic avian influenza (HPAI) with decreasing egg production was reported in a breeder duck farm on 16 January, 2014. The next day, hundreds of dead wild birds were found in Donglim Reservoir, which is located near the index case farm. H5N8 (HPAI) viruses were isolated from both cases. This was the first outbreak of H5N8 HPAI in the Republic of Korea, although there have been four previous outbreaks of H5N1 HPAI, which were all successfully eradicated.

Rapid and accurate diagnosis of the causative virus is essential for effective control of HPAI outbreak.

Animal and Plant Quarantine Agency (QIA) is the headquarters of avian influenza diagnosis in Korea. Until now, several diagnostic methods for avian influenza have been developed. A rapid antigen test kit was applied as a screening test at the suspect farm. In the case of a positive reaction, the regional government implemented movement restrictions until laboratory confirmation.

Laboratory diagnostic methods were divided into several steps. First, necropsy of dead birds was conducted by special pathologists for avian species. Then samples such as tissues, swabs and faeces were inoculated into embryonated eggs for virus isolation. At the same time, the reverse-transcription polymerase chain reaction (RT-PCR) was conducted for rapid confirmation. RT-PCR kits are composed of specific primer sets for NP, M, H5, H7 and H9 gene. In the case of H5 positive reactions, infected animals were destroyed in on-going efforts to prevent the spread of HPAI. Virus isolated by egg inoculation was re-confirmed by RT-PCR. Pathogenicity of H5 virus was determined by sequence analysis of amplified H5 gene. For the index case virus, the pathogenic test was also performed by chicken inoculation. In addition, the HI test was applied using H5 specific antigen as a serological test in avian and mammalian species such as chicken, duck, pig, dog, etc. Birds from H5 antibody positive farms were also destroyed.

Active surveillance has been performed for the detection of remaining HPAI virus.