In this study, we performed nationwide surveillance on AIV from LBM in Korea from 2006 to 2008. Live bird markets (LBMs) are highly productive sources of avian influenza viruses (AIVs) because they provide an ideal environment for viral reassortment and interspecies transmission. However, only limited reports provided information about ecology of AIV circulating in Korean LBM.

In this study, we performed nationwide surveillance on AIV from LBM in Korea from 2006 to 2008.

- To understand the epidemiology of the AIVs in Korean LBM
- To understand the role of LBMs as sources of AIV evolution
- To determine the animal species that possess the potentials of expanding host range of AIVs

**RESULTS**

Virus isolation and distribution of subtypes (Table 1)

- Sixty-five AIVs (H3, H4, H6 and H9) were isolated from 644 tissue samples collected in LBMs.
- Prevalence of subtypes: H9 (44) > H3 (13) > H4 & H6 (3)
- Most H9 subtypes were isolated from Galliformes and other subtypes were isolated from Anseriformes.
- A single H3N2 virus isolated from nasal swabs of farmed dogs sold in LBMs.

Phylogenetic analysis (Figure 1 & 2)

- In H9 HA tree, all H9 viruses belonged to the Korea lineage (CK/Korea/96-like lineage) that has been prevalent in chicken farms in Korea and genetically far from other Asian H9 lineage (Fig 2-a).
- In H3 HA tree, all H3 viruses formed Korea LBME lineage within Eurasian avian lineage (Fig 2-b).
- Two genes of the AIVs in LBMs were divided into two clusters, LBME lineage and Korea lineage (Fig 2-c).
- Six internal genes of H9N2 viruses of Korean lineage were widely dispersed in AIV gene pool together with those of AIVs in Eurasian aquatic birds.
- There were genetic diversity of AIV in LBMs leading to generate numerous reassortants including CIV (Fig 1).

Animal experiments (Table 2 & 3)

- Quail (Table 2): Most isolates replicated in the respiratory tracts.
- Chicken (Table 2): All the H9N2 viruses from chickens replicated well in trachea of chickens, as well as single H4N2 and HIN2 virus from ducks. However, none of H9N2 viruses replicated in chickens.
- Mice (Table 2): H3, H4, and H6 viruses from ducks replicated well without pre-adaptation.
- In contrast, none of H9N2 viruses from chickens were replicated in the lung of inoculated mice.
- Dog (Table 3): CIV and two AIV examined replicated in dogs.
- Clinical sign: fever (>39.5 °C), sneezing, nasal discharge, and coughing.
- CIV induced severe clinical signs, but 2 H3 viruses from ducks induced mild clinical signs without fever.
- Virus shedding: detected both in dogs inoculated with CIV and one AIV.
- Seroconversion: observed in all dogs inoculated with CIV or AIV.

**DISCUSSIONS**

- Korean LBM played an important role in extending genetic diversity of influenza viruses in Korea.
- The newly evolved AIVs have been continuously generated by reassortment events in ducks in LBMs with the potential of expanding the host range to multiple species.

**CONCLUSIONS**

- Continued monitoring of poultry population, in particular quails and ducks, in Live Bird Markets in Korea with Potential for Expanding Host Range.

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