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学位論文内容の要旨
Abstract of the dissertation

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学位論文題名
The title of the doctoral dissertation

Epidemiological investigation of pathogenic *Leptospira* spp. harbored by water buffalo (*Bubalis bubalis*) in the Philippines
（フィリピンの水牛(*Bubalis bubalis*)が保有する病原性レプトスピラの疫学的研究）

Studies on *Leptospira* infection in water buffalo have not been extensively explored despite the endemic nature of the disease in the Philippines. As a source of milk, meat, aesthetic products and draft power, water buffalo is an important livestock in the country. Therefore, it is deemed necessary to understand the status of leptospirosis among this animal and clarify its role in the persistence of this zoonosis affecting animal and public health. This study analyzed the leptospires detected in water buffalo using both serological and molecular techniques in the Philippines, where previously limited serological data were available.

In Chapter I, I demonstrated the widespread occurrence of leptospirosis in a water buffalo herd in an intensive-type farm in the Philippines. Higher seroprevalence and MAT titers among water buffaloes of one year of age and older confirmed the active *Leptospira* transmission and the crucial role of animal management in sustained circulation of *Leptospira* infection at least at communal farming level. Although involvement of field rats as a source of infection was not conclusive, the role of these rodents in the maintenance of leptospires on the farm should be considered as a possibility pending further studies on external sources of leptospirosis.

In Chapter II, I confirmed the presence and high prevalence of pathogenic leptospires using molecular diagnostic test in an intensive-type water buffalo farm that was investigated in Chapter I. Continued and active circulation of pathogenic *Leptospira* either through animal-to-animal transmission as evidenced by infection from all animal groups or from environmental source may occur within the farm as shown by related *Leptospira* sequence from water buffalo and field rat. Molecular diagnostic test like nested PCR in combination with serological test such as MAT is recommended in investigating animal leptospirosis.

In Chapter III, I revealed the presence of various pathogenic *Leptospira* species in water buffalo and cattle in the Philippines. These local animals, particularly water buffalo, were infected with multiple *Leptospira* species that diversified as a possible consequence of interaction with host animals and environmental factors. This study emphasized the significance of one farm as a possible source of *Leptopira* infection distributed in different locations. My results suggest that these animals may act as a significant reservoir of leptospires in the area and pose a potential risk to local agricultural communities as well as a possible major economic loss in the livestock industry. Strict farm biosecurity measures, periodic testing and treatment of infected herds and quarantine to prevent the spread of infection from one farm to another are necessary to control leptospirosis.

The findings from this study will serve as a preliminary information and guide regarding the current prevalence and carrier status of leptospirosis among water buffalo and cattle in the Philippines. However, further investigations into the effect of *Leptospira* virulence on the reproductive performance of these animals and elucidation of the role of livestock as either accidental or maintenance hosts are needed to take future actions to prevent leptospirosis from causing risks to public health and economic losses to the large ruminant farming industry in the country.