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Genetic characterization of methicillin-resistant *Staphylococcus aureus* isolated from pigs and pork meat in Thailand

(タイにおいてブタ及び食肉から分離されたメチシリン耐性黄色ブドウ球菌の遺伝学的特徴)

MRSA has been a major public health concern in humans and various animals. LA-MRSA strains have always been associated with livestock or their products. This strain has emerged in different countries globally. There are few reports on epidemiology of Thai LA-MRSA and their molecular characteristics. Moreover, prevalence of LA-MRSA in slaughtered pigs is still unknown.

In Chapter I, the objective was to investigate the prevalence, molecular characteristics, and antimicrobial resistance pattern of MRSA isolated from slaughtered pigs and retail pork in the central region of Thailand. A total of 204 nasal swab and 116 retailed pork samples were collected from three slaughterhouses and four fresh markets, respectively. Individual samples were used for screening for MRSA and obtained isolates were examined for drug-resistance profiling for 12 antimicrobial agents of 10 drug classes. In addition, SCCmec typing and MLST were conducted to obtain genotype profiles. MRSA were isolated from 11 and 52 nasal swab and pork samples, respectively. The prevalence was significantly higher in the pork than in the nasal swab samples (p -value < 0.05). A high prevalence of ST9-SCCmecIX and ST398-SCCmecV with high-level antimicrobial resistance from markets and slaughterhouses indicated the spreading of MRSA with these genotypes in the Thai swine processing chains.

In Chapter II, LA-MRSA ST398 isolates from Chapter I (one slaughtered pig and six retail pork samples) were compared by WGS with previous data found for China samples, international reference collection samples, and Danish pig samples. The results showed that Thai LA-MRSA ST398 from animal-food products were associated with lineages found in Danish pigs, especially L1 and L3 of Danish pigs.

This finding suggests that LA-MRSA can spread into the general population. Thus, it is important to identify MRSA among animal food production chain and implement effective control measures to prevent transmission of LA-MRSA among pigs, humans, and animal-food products.