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Assessment of airborne bacteria and fungi in pig buildings in Korea

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Inhalation of biological contaminants in a pig building can be detrimental to a farm worker's health through effects such as infection, allergy or toxicosis. The principal aim of this field study was to determine the concentrations and emissions of biological contaminants, i.e. airborne bacteria and fungi, in the different types of pig buildings in Korea to allow an objective comparison with the other countries in terms of pig housing types. Pig buildings in this research were selected using three criteria such as manure removal system, ventilation mode and the growth stage of the pigs. Measurements of the concentration and emission of total airborne bacteria and fungi in the pig buildings were performed in 5 housing types and on 15 farms.

The concentrations of total airborne bacteria and fungi in the pig buildings were averaged to $4.13 \hat{A} \log(\text{cfu} \hat{A} \text{m}^{\hat{A}3})$ and $3.14 \hat{A} \log(\text{cfu} \hat{A} \text{m}^{\hat{A}3})$, respectively, and ranged from 1.16 to $10.26 \hat{A} \log(\text{cfu} \hat{A} \text{m}^{\hat{A}3})$ and from 0.48 to $6.86 \hat{A} \log(\text{cfu} \hat{A} \text{m}^{\hat{A}3})$,

respectively. The mean emissions of total airborne bacteria and fungi per pig (75 kg in terms of liveweight) and area (m^2) from pig buildings were $0.98 \log(\text{cfu h}^{-1} \text{ pig}^{-1})$ and $0.73 \log(\text{cfu h}^{-1} \text{ pig}^{-1})$ and $1.32 \log(\text{cfu h}^{-1} \text{ m}^{-2})$ and $0.96 \log(\text{cfu h}^{-1} \text{ m}^{-2})$, respectively.

The pig buildings with a deep-litter bed system showed the highest emissions of total airborne bacteria and fungi ($p < 0.05$). However, the emissions of total airborne bacteria and fungi from the other pig buildings were not significantly different. This study showed that the mean concentrations of total airborne bacteria and fungi in pig buildings situated in Korea were generally lower than those in other countries. The mean emissions of total airborne bacteria and fungi in the pig buildings showed little differences between Korea and other countries. It was concluded that the concentrations and emissions of total airborne bacteria and fungi were relatively higher in the pig buildings which are managed with deep-litter bed systems and those ventilated naturally than other pig housing types.



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