

Increasing farm size enhances the use of biosecurity measures – prognosis for year 2033

Kyyrö J, Sahlström L, Virtanen T, Lyytikäinen T, Niemi J

Biosecurity is important in preventing disease transmission. Animal production in Finland is undergoing a structural change where fewer farms continue the production and the number of animals per farm is increasing. The aim of this study was to assess the current use of biosecurity measures and to predict their implementation frequencies in twenty years, based on the increasing farm size.

Questionnaire study

This study was based on a questionnaire sent to 4000 farmers (response rate 41%). There were 17 different biosecurity measures from which the producers were requested to indicate which ones were always in use at his farm:

- use of boots or protective clothing (by farmers and visitors)
- hand washing (by farmers and visitors)
- doors are kept locked
- animal facilities are cleaned between batches of animals
- separate animal loading area exists and it is washed after loading
- hygiene barrier
- dividing animals into compartments
- a leak-proof carcass container to store dead animals
- traffic at the farm is organized considering the biosecurity aspects
- pest control

Prognosis

The prognosis is based on the increasing farm size and its relationship with the use of measures. A generalized linear model was built to estimate the prevalence of each biosecurity measure in year 2009 by the farm type and a standardized farm size within farm type. We projected the average farm size for each farm type in year 2033. These were based on geometric series of farm size changes in 1997-2009. The annual increase in size was 5-8%. The projection was scaled into the model for 2009 and used to calculate the predicted prevalences of biosecurity measures.

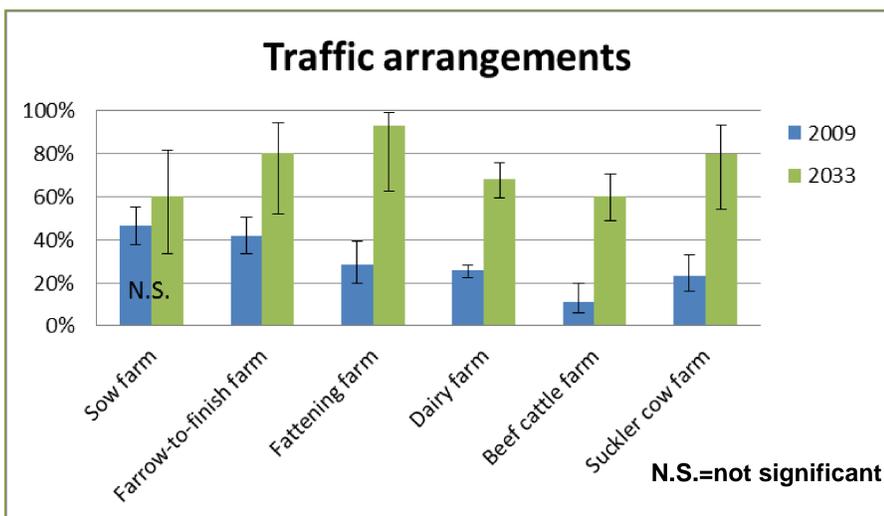


Figure 2. The proportion of farms where traffic is organised considering the biosecurity aspects by farm types.

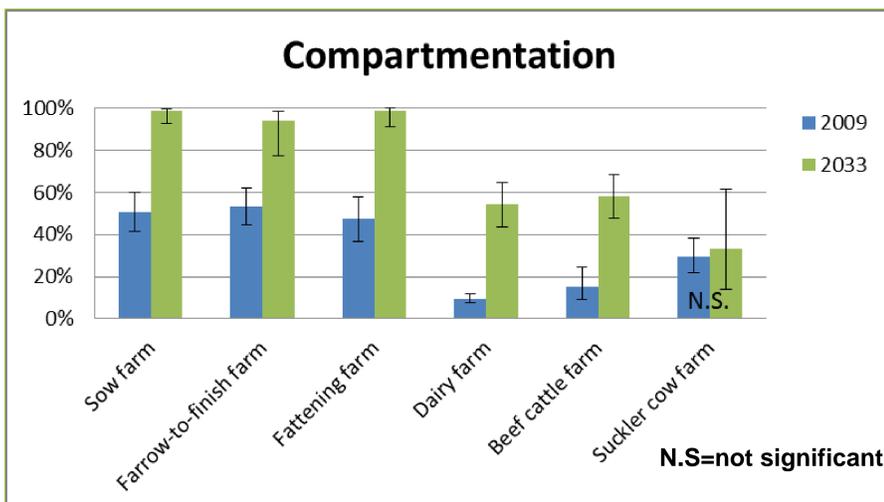


Figure 3. The proportion of farms where animals are divided into compartments by farm types.

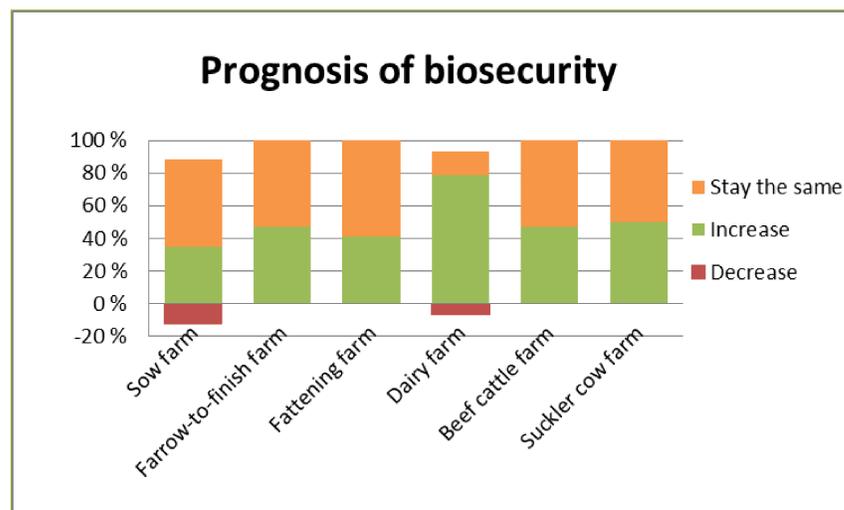


Figure 1. Change in the implementation frequencies of relevant biosecurity measures in the future by farm types.

Results and conclusions

In most cases, the implementation frequency of biosecurity measures will increase or stay the same. Results indicate that some measures will even become less common: washing hands by farmers and visitors in sow farms and control of rodents and birds in the feed storage in dairy and sow farms (figure 1). Traffic arrangements and compartmentation are the measures in which there will be the largest changes in most production types (figures 2 and 3).

Increasing farm size seems to predict a better biosecurity in all production types in the future. There are also other factors than farm size which may affect the future of biosecurity and these should be studied further.



Corresponding author:
jonna.kyyro@evira.fi,
 Finnish Food Safety
 Authority Evira,
 Risk Assessment
 Research Unit,
 Finland