

Abstract

Transitional Geographical Model for the Analysis of Risk Associated with Animal Movements.

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The trade of animal origin commodities implies the use of risk analysis procedures able to give rapid and easily understandable information about the disease. Mathematical models are used for the quantitative analysis of the risk associated to animal movements in the seasonal spreading of animal diseases in terms of time. Moreover, these models can be linked to geographical data in order to predict the risk of the disease in terms of space. The present study describes a risk analysis transitional geographical model applied to animal movements. This stochastic model is applicable to direct transmission diseases and has the advantage to show the results of risk analysis on geographical bases, in the form of synthetic and explanatory information on the sanitary risk related to animal movements. The model provides numerical estimates of the probabilities and consequences associated with different scenarios. It facilitates the communication of risk and provides decision makers with a valid support tool. The parameters of the model and its predictability have been validated using data on sheep and goats transhumance movements of central and southern Italy and considering brucellosis as the direct transmission disease under study.