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## **B-11. APPLICATION OF QUANTITATIVE METHODS FOR RISK PREDICTION OF TRANSBOUNDARY ANIMAL DISEASES**

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### **RESUMO**

Transboundary animal diseases (TADs) are diseases that can spread fast without respecting countries' boundaries. Also, the economic losses can seriously compromise countries' economies if the outbreaks are not fast mitigated. Here we are using the two notifiable hemorrhagic fevers of swine, African swine fever (ASF) and classical swine fever (CSF) as examples of TADs, and we developed three quantitative methods for animal surveillance, focusing on early detections of these diseases. The unprecedented spread of ASF since 2007, reaching now, the five continents, and the reemergence of CSF in many countries after extended periods of freedom, shows the importance of developing methodologies to predict the risk for the introduction of these diseases into free areas. Here, we will present the results of research intended to apply risk-based strategies tackling country, state, and farm-levels of surveillance. Methods used here included conjoint analysis, which is a marketing tool, associated with ordinal logistic regression for predicting the risk of introduction of ASF into a country, showing in a risk map, what states will be at high risk of possible incursions of ASF; stochastic quantitative risk assessment models for introduction of CSF into a state, depicting what municipalities would be at risk considering two different ways of introduction, which impose risk for commercial and backyard farms separately. And the scoring system, for developing a protocol for enhanced passive or participatory surveillance of hemorrhagic fevers on farms, where the early detection will be assessed using risk factors and symptoms as triggers for testing suspected pigs. These three approaches may offer different ways of risk-based surveillance to be performed by official veterinary services in different spheres of competency. In conclusion, each level of surveillance, national, state, or at the farm, can aid official veterinary services to work with the available data, and perform the analysis that suits better for the capillarity of data and details that are available. Also, in a whole or part, the risk still can be assessed reliably, therefore, it can be a decision of the country or area regarding the best approach to each moment. These methods are dynamic, allowing prompt re-evaluations, and keeping risk maps up to date. And finally, risk-based surveillance may help official veterinary services and the industry to save financial and human

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resources in the allocation of prevention activities, hence increasing the chances for early detection and implementation of mitigation measures for TADs.

**PALAVRAS-CHAVE:** Transboundary animal diseases, African swine fever, classical swine fever, risk analysis, surveillance, early detection

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