

# BLUETONGUE VIRUS TRANSMISSION MODEL FOR THE AUSTRIAN REGION OF STYRIA

A.S.R. Duarte<sup>1\*</sup> T. Nunes<sup>1</sup>  
Y.M. Vaz<sup>1</sup> K. Fuchs<sup>1</sup>

In the absence of a bluetongue (BT) revaccination plan in 2010, the cattle population from the region of Styria will become again susceptible to bluetongue virus (BTV) after the end of the immunity conferred by the BTV serotype 8 inactivated vaccine that was used in the 2009 emergency vaccination campaign. Even though no BT outbreaks were recorded in Styria, the region extended area has been considered as a high risk zone for BT occurrence during the summer season months. It is therefore essential to investigate the probability of virus establishment and spread in case the cattle population becomes susceptible again. The basic reproduction number ( $R_0$ ) provides an index of transmission intensity and establishes threshold criteria. It is a powerful tool that can be used in the risk assessment of disease invasion, and is defined as the average number of secondary infections derived from the introduction of a single infected

individual in a susceptible population. If  $R_0$  is higher than 1, the infection is able to invade a host population.

An equation used by other authors in 2008 helped to develop a BTV transmission model for domestic cattle of Styria, by computing  $R_0$  monthly values for BT infection between April 2008 and February 2009. The input parameters of the deterministic model were based on available scientific data, and field entomological and climate data from the region of Styria. Results indicated that the risk of occurrence of secondary infections in the summer months was not negligible, with an  $R_0$  maximum estimate of 2.66.

**KEYWORDS:** BLUETONGUE VIRUS – DISEASE TRANSMISSION – MODEL – AUSTRIA.

1. Technical University of Denmark, National Food Institute, Group of Epidemiology and Risk Modelling, Mørkhøj Bygade 19, Building H, 2860 Søborg, Denmark.

\* Corresponding author

Tel.: +45 40 21 31 89; Fax: +45 35 88 70 28

E-mail: asrd@food.dtu.dk