

STOC free: WP1, Deliverable 1.3

Description of the STOC free model

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Abstract

The aim of this document is to describe a statistical framework called the STOC free model for the estimation of a probability of infection that can incorporate the information available from different control programmes against cattle diseases. These control programmes rely on a surveillance programme for the definition of a status regarding infection (e.g. herd free from infection). It is assumed that, as part of these surveillance programmes, tests are carried out at regular time intervals. These tests are imperfect and defined by a sensitivity and a specificity. Knowledge about disease dynamics and risk factors of infection can also bring information for the estimation. Two situations are considered. When data from control programmes are available, statuses regarding infection as well as test characteristics, disease dynamics parameters and strengths of association between risk factors of infection can be estimated. A Bayesian model allowing to perform these estimations is described. When parameter estimation is not possible or wanted, statuses can be predicted assuming known values or distributions for all parameters. In the document, modelling hypotheses and a statistical model are described. Computer code to run the model is provided. The document ends with a description of the further areas that will be investigated on the modelling part of the STOC free project.