Developing decision support tools: a two way street

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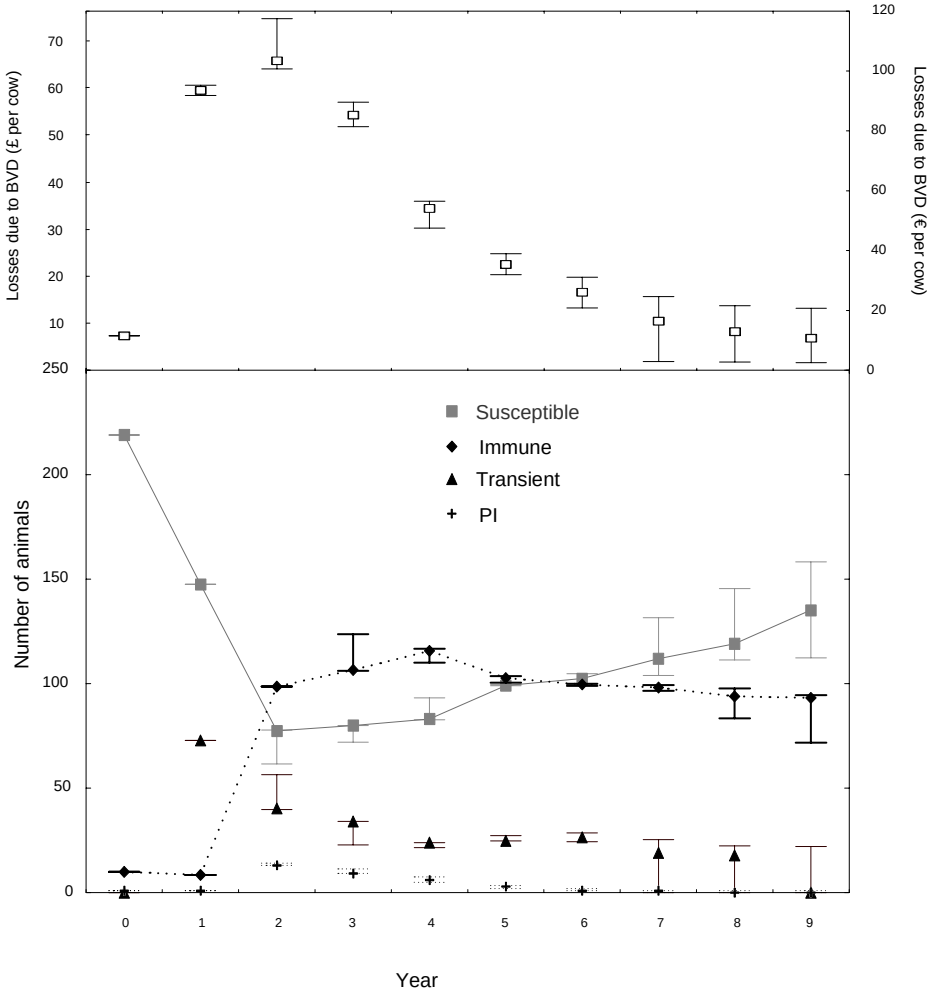
Summary:
This presentation will describe a process of building decision support tools for use by farmers and their veterinary advisors. The process commences and finishes in discussion with the end users at veterinary practice based farmer meetings as part of a regional health programme (Gunn et. al., 2001). At such meetings a summary of current information available about endemic diseases of concern is presented. Control options are described and cost benefits of possible actions considered. The major focus for the farmers is usually prevalence and costs. Such methods may help the farming community recognise not only, which diseases are of greatest economic importance but also the relative importance of diseases in comparison with other factors such as milk price variation.

The project team has developed a methodology of building state transition simulation models for diseases such as BVD and paratuberculosis in beef and dairy herds or maedi-visna in sheep flocks. This approach was chosen to make our method as simple as possible for others to understand (however in addition we have compared these Markov chain models with other more complex methods to explore their utility). This simplicity is important for our advice to have the confidence of the industry. Conservative cost assumptions are selected to parameterise the models to ensure they remain believable.

The acquisition of knowledge with which to parameterise such models has become a project in its own right, as have issues of validity of various sources of information (Gunn et. al., 2001). Currently this work is focussing on calf pneumonia, calf enteritis and maedi-visna, An important potential source of such data is the very health schemes set up in response to the increased awareness through the focus groups. The outputs from epidemiological models have been used as the basis of economic appraisal for the losses associated with each disease and those losses compared with the costs for control options. This presentation will utilise the results for various diseases to demonstrate this concept. Figure 1 illustrates this for simulated BVD outbreaks for beef herds.

Figure 1: Expected (mean) discounted costs (in £ and €) per annum and median number of animals in each disease category (bars indicate interquartile range) from a BVD outbreak simulation model run with the intermediate annual transmission probability value (p=0.6). The connecting lines between some points are provided as a visual aid and do not represent interpolation since the model is based on discrete annual time-steps. From Gunn et al. 2003



Discussion with the end user group had highlighted the problem of examining individual diseases in isolation from the whole farm business context. Our team is therefore examining methods to bring disease and business systems together using MOTAD (Minimisation of Total Absolute Deviation) farm business models, which generate risk efficient disease strategies, within the constraints of specific farm resources (Stott et. al., 2003). So far we have used such models to evaluate individual diseases and now we are exploring disease interactions within that context, in order to develop models which can provide guidance on the optimum strategy for a combination of diseases. The results of these developments will be described using BVD and paratuberculosis in beef cattle as examples.

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