Control and eradication of endemic infectious diseases in cattle

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In recent decades, several programs for control and eradication of infectious diseases in cattle have been carried through in Denmark. The programs have evolved in different ways due to different characteristics of the different infections. Still, there seem to be a number of necessary pre-conditions that need to be addressed for a program to be successful. The organization of all the key elements in a systematic framework will enable future decision makers to identify important knowledge gaps and to make the decisions of when to initiate a control program, how to carry it through and how to monitor its success.

Through the analysis and compilation of experiences from 3 infectious agents (bovine virus diarrhoea virus, Salmonella Dublin and Mycobacterium avium subsp. paratuberculosis), that either have been eradicated or for which there currently are control programs, we propose the following key elements to be addressed in order to take decisions on initiating and carrying through control and eradication programs:

1) Motivation is a basic factor, in order to have stakeholders invest time and money. Motivation can be related to different values such as economic losses, animal welfare or the infection being zoonotic; 2) Biosecurity measures must be sufficiently understood in order to stop or at least mitigate continuous transmission of infection; 3) Purpose specific and systematic test-strategies that address the objectives of a classification of herd infectious status, identification of individual infected animals and monitoring of free herds after clearance of infection; 4) A pilot study is considered crucial at a relatively early stage. The pilot study provides a proof of concept that identified biosecurity measures and test strategies are feasible and efficient in a practical setting; 5) Resources include an analysis of available laboratory capacity, suitable databases for handling all the information, evaluation of whether there is sufficient will to comply with recommendations, or it is necessary to support the program by legislative means; 6) The decision itself is very complex, and it is therefore recommended to sum up the existing knowledge by asking a number of questions such as “Why is it important to control the infection?”, “Which knowledge gaps exist?”, “Who should be involved and informed?” etc. This element can be seen as a final check list before initiation of a program. If there are any weak spots, it can be decided to await clarification. If the program is initiated despite presence of weak spots, it must be transparent for everyone what they are and who will take any responsibility of failure; 7) Alongside with the initiation of the program, a communication plan must ensure that all participants and stakeholders have relevant and updated information. For example, farmers must have operational guidelines for biosecurity measures and veterinary practitioners must have exact knowledge of sampling animals for laboratory testing; 8) Finally, follow-up investigations must accompany the program. Thus re-infection of cleared herds may reveal unknown ways of transmission and it must also be considered if legislation is necessary to support the program as there always seems to be a ‘tail’ of herds that is particular difficult to handle.

After a successful eradication, the infection can then be seen as exotic, and the focus will change to ‘preparedness in peacetime’ including occurrence in neighbouring countries and methods for early detection of infection.