

## DOES REAL-TIME RT-PCR FOR CSF MARK THE BEGINNING OF A PARADIGM SHIFT IN THE CONTROL OF CSF?

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### Introduction

When “one conceptual world view is replaced by another” we are talking about a paradigm shift (Th. Kuhn, 1962). Based on new scientific data, Kuhn’s concept of paradigm shifting will be used in this presentation to propagate the necessity of changes in the policy to control and eradicate Classical Swine Fever (CSF).

The present CSF control strategy is more than 20 years old. Two fundamental changes have occurred which justify a new policy. In the first place there is no more understanding for the strict non-vaccination strategy. Culling of healthy pigs has become an ethical and animal welfare issue and is not tolerated any more. Secondly, significant advances in diagnosis and modern vaccines have been made (real-time RT-PCR, DIVA strategy). The foundations for new concepts to control CSF based on novel diagnostic tools and vaccines have been laid.

### The current policy to control and eradicate CSF (*old paradigm*)

According to EU Directive 2001/89/EC (Anon. 2001) the general measures to control CSF are:

- culling of all pigs within the infected premises,
- installation of protection and surveillance zones,
- restrictions for trade and transport.
- extensive epidemiological, clinical and laboratory examinations.

Additional special measures, such as culling of all pigs within a 1000 m radius and emergency vaccination can be used. However, vaccination has never been applied so far.

The logic behind the actual CSF policy is that only seronegative pig populations are free from risk while pigs with CSF antibodies are a risk factor. Vaccination becomes impossible since it would be a “proof” for the presence of CSF. Consequently, freedom from CSF is defined as freedom from CSF antibodies. Therefore, there is a general request for seronegative pig populations to permit the international trade of pigs and pig products. In this strategical concept the serological diagnosis, which is an indirect diagnostic approach, is of paramount significance (the basis for the old paradigm).

### The future policy to control and eradicate CSF (*new paradigm*)

For avoiding mass culling of healthy uninfected animals a diagnostic strategy must be used which guarantees that only pig herds with virus positive animals are removed and no CSF virus circulates any more within the pig population. The diagnostic approach has to focus on the presence of virus and no longer on the presence of antibodies. This means that the focus of disease control has to be shifted from the indirect approach (serological testing) to the direct approach (direct detection of virus). The logic behind the future CSF policy would be that only CSF virus free pig populations are free from risk. Pigs with CSF antibodies are no risk factor. Thus, vaccination becomes a useful tool for CSF control. However, this shift can only be done if appropriate diagnostic tools are available.

The real time RT-PCR has the potential to replace the conventional diagnostic methods used at present (Hoffmann et al. 2005). With this tool we are for the first time in a position to change the strategy and to fulfil the above-mentioned requirement (control of virus freedom). The real time RT-PCR based strategy has a higher reliability, since it is a direct search for CSF virus. Antibodies or cross reactions with other pestiviruses do not disturb the diagnosis. Vaccination does not interfere with the diagnosis. In case of a CSF outbreak emergency vaccination can be used. Culling of healthy pigs within a 1000m radius will be avoided since freedom from CSF virus will be checked by rapid PCR testing. The risk will not be higher than with the present strategy based on antibody control.

During the presentation given by Dr. Martin Beer (“*Eradication and control of a CSF epidemic based on real-time RT-PCR and vaccination*”) different models of the new CSF control strategy will be presented and discussed. The advantages of the PCR based system compared to the present diagnostic approach are shown.