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The Danish National Veterinary Institute and disease surveillance

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The National Veterinary Institute at the Technical University of Denmark, DTU-Vet, conducts research in infectious diseases in livestock, wildlife and fish, and diagnoses diseased animals. We give advice to public authorities and cooperate with these on the Danish veterinary contingency plan. The research at DTU-Vet covers methods for detection, control and prevention of many infectious diseases in animals, including use of animal disease models for comparative studies of human diseases. However, our main focus is on notifiable diseases, as well as other severe infectious diseases that affect farm livestock.

Veterinarians can submit samples from diseased animals for diagnosis. For notifiable diseases the diagnosis is free, whereas we diagnose other diseases on commercial terms. All our diagnostic services are based on accredited or quality-assured analysis methods.

DTU-Vet is responsible for the laboratory component of the Danish veterinary contingency plan, which puts emergency procedures into action in the event of suspected or actual outbreaks of serious infectious animal diseases. The contingency plan is supported by our activities in conjunction with a range of national monitoring programs on animal diseases and zoonoses.

We will give a general overview of the activities of DTU-Vet with focus on participation in serological disease surveillance and on two selected examples from the laboratories:

Porcine Epidemic Diarrhea (PED) was first identified in Europe in 1971, and PED virus (PEDV) was detected as etiologic agent in 1978. Later, this virus was reported in Asia during the 1980s. The outbreaks in this part of the world were more severe than in Europe and became increasingly problematic. In May 2013, PED was identified for the first time in the central Iowa of the United States. The PEDV strain, circulating in North America, showed a close similarity with 99.5 % nucleotide identity to a Chinese strain from 2012. Since September 2014 outbreaks of PED with strains similar to the strains circulating in North America has been observed in Europe. Since 1988 the PEDV has been grown in cell culture and this has led to the development of a blocking ELISA based on whole virus antigen. With introduction of the new PEDV strains from America to Europe it is of crucial importance to test the sensitivity and specificity of this test in the context of these new strains.

The Danish surveillance on Salmonella antibodies in hen eggs is performed by DTU-Vet, and has been one of several important tools for paving the road for the achievement of Danish EU special status on importation of eggs in 2012. When testing serum and egg yolk, a mix-ELISA is used, based on *S. typhimurium* and *S. enteritidis* antigens. 2009-2012 the mix-ELISA produced an unacceptably large

amount of seropositive findings that could not be confirmed by subsequent confirmatory bacteriological sampling. Therefore we enhanced the specificity of the ELISA, without losing sensitivity, by refining the antigens. This example will be given to illustrate the way that laboratories sometimes have to keep optimizing and validating tests currently used, in order to adapt to the scope of the surveillance.