

## Mutual transmission of important infectious diseases between livestock and wildlife in Europe

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Although some data on infectious diseases in wildlife are available in various European countries, there is more need for systematic surveillance and co-ordinated research.

Oral vaccination of foxes (*Vulpes vulpes*) against rabies has been practiced in Europe since 1978 and has succeeded in greatly reducing the occurrence of this disease in foxes: this is an example of coordinated activity against a disease that affects both wild and domestic animals as well as humans. Classical swine fever (CSF) is affecting wild boars (*Sus scrofa*) and domestic pigs in several parts of Europe. Mutual transmission between pigs and wild boars mainly occurs by ingestion of virus-contaminated food or water. Presently, CSF has been officially recorded in wild boars in six European countries: Germany, Italy, Austria, France, Slovakia and Czech Republic. Mutual transmissions of myxomatosis and rabbit haemorrhagic disease in domestic and wild rabbits (*Oryctolagus cuniculus*) is reported in many European countries. Both diseases in combination have dramatically reduced local rabbit population densities. Studies of bovine viral diarrhoea (BVD) in Germany have indicated that distinct BVDV-strains might circulate in free-ranging roe deer (*Capreolus capreolus*) populations and that virus transmission is independent of domestic livestock. Sequence analysis of the BVDV isolated from roe deer showed a unique position of this roe deer strain within the BVDV group I. In a study of malignant catarrhal fever in deer in Germany, seropositive reactors and positive PCR results detected in sheep samples, which originated from the same area as antibody-positive fallow deer (*Cervus dama*), might indicate that in this case sheep are the main reservoir animals. In eastern Germany, European wild boars were investigated for the occurrence of pseudorabies virus infections, which appear to be endemic in the wild boar population and persist separately without affecting the domestic pig population.

Important bacterial diseases like tuberculosis, paratuberculosis, and brucellosis can be transmitted between livestock and wildlife. Bovine tuberculosis in Europe is still periodically reported from Spain, Italy and the UK. The presence of a common *Mycobacterium (M.) bovis* genotype for example in wild boars and cattle in northern Italy as well as in cattle, badgers (*Meles meles*), and deer in the UK confirms the possible interspecies transmission. Paratuberculosis has been reported in free-ranging Alpine ibex (*Capra ibex*) and red deer from Italy. Generally, young red deer show a sudden onset, with rapid loss in body condition and diarrhoea. Interestingly, 67% of wild rabbits in Scotland were infected with *M. paratuberculosis*. Molecular genetic typing techniques could not discriminate between selected rabbit and cattle isolates from the same or different farms, suggesting that the same strains may infect and cause disease in both species and that interspecies transmission may occur. *Brucella suis* biovar II infection recently increased in domestic pigs, leading to the assumption that a reservoir in wild boar and European brown hare (*Lepus europaeus*) may be a source of this pathogen. In the European Alps, infectious keratoconjunctivitis (IKC) is of particular interest for both, domestic and wild *Caprinae*. Spill-over from sheep living in close proximity to wildlife during summer was the origin of point source epidemics in wild *Caprinae*. IKC, however, is not self-maintained in wildlife. In conclusion, only single investigations have been performed regarding mutual transmission of pathogens between livestock and wildlife in Europe. Therefore, the modes of transmission for most infectious diseases in wildlife have not been fully elucidated. Moreover, the ecological impact for most of the infectious diseases in wildlife is still unknown.