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## Abstract

### A long term epidemiological study of bovine viral diarrhoea infections in a large herd of dairy cattle

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Epidemiological aspects of bovine viral diarrhoea virus (BVDV) infections were studied longitudinally in a large dairy herd for three years. At the start of the study, practically all the cows more than four years old had BVDV antibody titres, whereas the younger stock were almost all seronegative. The spread of the virus was monitored in a part of the population that contained only transiently viraemic cattle and in another part that contained persistently viraemic calves. Among the lactating cows the virus circulated for two-and-a-half years, although they had no direct contact with persistently viraemic cattle during this period. The highest transmission rate occurred when a large number of susceptible heifers was added to the population of cows that contained transiently viraemic cattle. The circulation of BVDV among the lactating cows ceased while 27 seronegative cows were still present. Both findings are in accordance with predictions from simple epidemic models. The susceptibility of the cows that remained seronegative was confirmed experimentally. In contrast

with the limited circulation of BVDV caused by transiently viraemic cattle, virtually all susceptible cattle that came into contact with a persistently viraemic calf became seropositive within three months. Transplacental BVDV infections were not detected in the calves born to cows that had antibodies against the virus due to an infection that had occurred at least four years earlier. Transplacental transmission of BVDV did not occur in most of the pregnant cows that were infected before approximately the 60th day of gestation, but when cows became infected later in gestation the virus virtually always invaded the fetus. Clear conclusions on transplacental infection were not always possible in fetuses infected in late gestation. The precolostral sera of six of 42 prenatally infected calves contained both virus and antibodies; the antibody titres were low. After retesting four to five months later, the two calves remaining on the farm were still viraemic, but they had become seronegative.