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Highly pathogenic avian influenza virus H5N1: Susceptibility of cattle

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Several mammalian species including humans are regarded as susceptible for highly pathogenic avian influenza virus (HPAIV) H5N1. Therefore, domestic animals with a risk of direct contact to poultry and humans are of special interest for epidemiological reasons. Whereas pigs, cats, and dogs have been identified as potential target species for HPAIV H5N1 infection, the susceptibility of cattle and buffalo is unknown. Therefore, bovine calves were intranasally as well as intratracheally inoculated with a high titer preparation of HPAIV H5N1 strain A/Cat/Germany/R606/06, isolated from a domestic cat with a fatal H5N1-infection. Only mild nasal discharge, but no further clinical signs could be observed following inoculation with HPAIV H5N1. Nevertheless, several intranasally inoculated animals shed low amounts of H5N1-virus, and all inoculated calves sero-converted with positive ELISA and hemagglutination inhibition values. In addition, high titers of neutralising antibodies of up to 1:256 could be detected. One of two naive control calves in direct contact to the intranasally inoculated animals also developed H5N1-specific antibodies with a delay of about one week. In conclusion, despite a clear resistance with regard to clinical signs, cattle could be infected and responded with easily detectable H5N1-specific antibodies. Due to our study results, monitoring programs and surveillance studies should also include bovine species, especially in HPAIV H5N1 endemic regions like Asia and Egypt with a high probability of poultry – cattle contacts.

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