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Subject: PRO/AH/EDR> COVID-19 update (450): animal, cattle, research, experimental infection

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CORONAVIRUS DISEASE 2019 UPDATE (450): ANIMAL, CATTLE, RESEARCH, EXPERIMENTAL INFECTION

A ProMED-mail post

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https://wwwnc.cdc.gov/eid/article/26/12/20-3799_article

Citation: Ulrich L, Wernike K, Hoffmann D, Mettenleiter TC, Beer M: Experimental infection of cattle with SARS-CoV-2. Emerg Infect Dis. 2020; 26(12) (dispatch, early release, last updated 21 Oct 2020); doi: <https://doi.org/10.3201/eid2612.203799>.

Abstract

We inoculated 6 cattle with severe acute respiratory syndrome coronavirus 2 [SARS-CoV-2] and kept them together with 3 uninoculated cattle. We observed viral replication and specific seroreactivity in 2 inoculated animals, despite high levels of preexisting antibody titers against a bovine betacoronavirus. The in-contact animals did not become infected.

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[Coronaviruses are known to cause a variety of diseases affecting mammals and birds. In animals, coronavirus disease entities have been recorded in swine, cattle, horses, cats, dogs, rats, birds, bats, rabbits, ferrets, mink, and various wildlife species; some of them are subclinical or asymptomatic.

In cattle, the betacoronavirus BCoV (bovine coronavirus) is known to circulate globally, associated with 3 distinct clinical syndromes: calf diarrhea, winter dysentery (hemorrhagic diarrhea) in adult cattle, and respiratory infections in cattle of various ages. The prevention of BCoV is based on vaccination, management, and hygiene. There are registered multivalent vaccines for dams (limiting the shedding of the virus and providing hyperimmune colostrum to confer passive protection to calves against BCoV diarrhoea). A modified live vaccine for oral vaccination of calves also exists.

The following (abridged) excerpt from "The Study" chapter in the FLI paper is noteworthy:

"We also tested the BCoV [bovine coronavirus] status of each calf. Before SARS-CoV-2 infection, all animals had neutralizing antibodies against BCoV, although the titers differed substantially among individual animals.

"We did not observe any cross-reactivity of the bovine coronavirus with the applied SARS-CoV-2 tests, because all animals tested negative by the nCoV IP4 PCR for SARS-CoV-2, the iIFA and VNT specific to SARS-CoV-2, and the RBD-ELISA before infection. Moreover, 2 animals with high BCoV sero-reactivity tested positive for SARS-CoV-2 RNA after inoculation, whereas those with lower BCoV-specific titers could not be infected, further confirming a lack of any cross-reactivity or cross-protection."

The "conclusions" chapter includes the following excerpt:

"We have no indication that cattle play any role in the human pandemic, and no reports of naturally infected bovines exist. Nevertheless, in regions with large cattle populations and high prevalence of SARS-CoV-2 infection in humans, such as the United States or countries in South America, close contact between livestock and infected animal owners or caretakers could cause anthro-po-zoonotic infections of cattle, as has been already described for highly susceptible animal species such as minks, felids, and dogs."

For a unique national control program for BCoV (under performance in Norway), please visit <https://doi.org/10.3389/fvets.2020.00167>. - Mod.AS]

See Also

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