

Market-stressed Cattle of a Shipping Fever Epizootic in a Texas Feedlot Have a High Infection Rate with Respiratory Bovine Coronaviruses

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Shipping fever (SF) of cattle results from stressful conditions favoring viral and bacterial infections of respiratory tracts that lead to severe respiratory distress with frequent fatal outcomes. The incidence and spread of respiratory viral infections of cattle developing SF were analyzed by a refined and sensitive virus isolation technology that detects all viruses known to infect bovine respiratory tracts, including respiratory bovine coronaviruses (RBCV) which multiply in highly polarized epitheloid cells such as the G clone of HRT-18 cells in culture. Sequential nasal swab samples from 105 cattle of this epizootic were collected at an order-buyer barn and on 3 subsequent intervals of 7 days in the feedlot. These samples were cultured for viruses and bacteria. The viral isolation attempts revealed that 64 cattle had RBCV infection at the order-buyer barn. Twenty-three additional cattle contracted this infection during transport to the feedlot so that 87 of them had this viral infection during the initial days of the epizootic. Ten cattle died and 9 of them had RBCV infections. Seventy-nine of the remaining 95 cattle had to be treated for acute respiratory disease and 69 of them had the RBCV infection. The 87 isolates of G-clone cell-dependent viral strains were identified as RBCV through cell fusion functions, specific hemagglutinins, and receptor destroying enzyme activities mediated through an acetyltransferase. Our refined virus isolation technology did not detect bovine herpesvirus 1, bovine adenoviruses, bovine pestiviruses, bovine respiratory syncytial viruses or bovine parainfluenza-3 in the samples collected at

the order-buyer barn and on arrival in the feedlot. Appropriate cell culture controls remained normal. Samples collected on the 2 subsequent periods are currently under investigation. The strong evidence furnished through virus isolation indicates that RBCV are emerging as a frequent infection of cattle affected with acute respiratory tract diseases, and they evidently played a significant etiological role in this severe SF epizootic.

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