

## Coronavirus 2 (Severe Acute Respiratory Syndrome) Stability in Dairy Products

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### COMMENTARY

SARS-CoV-2, a member of the Coronaviridae and betacoronavirus families, has been responsible for the most devastating pandemic epidemic of the 21<sup>st</sup> century, known as Coronavirus Disease 2019 (COVID-19), throughout the world since late December 2019. This virus is thought to be the third zoonotic betacoronavirus discovered in the current century. Both the Middle East Respiratory Syndrome-Related Coronavirus (MERS-CoV) and SARS-CoV, both beta-CoVs, caused widespread epidemics across the world. In terms of phylogenesis, there is an 89 percent similarity between SARS-CoV-2 and SARS-CoV. Camels and civets were reported to be intermediate hosts of MERS and SARS, respectively, but bats were thought to be the source of both. Animals that contain the virus and eventually transmit it to humans are referred to be intermediate hosts. CoVs, in general, required intermediate hosts before infecting humans.

Several pieces of evidence point to bats as the most likely primary source of the COVID-19 pandemic, although the intermediating host is unclear. COVID-19 infection might present with no symptoms or with mild to severe lung congestion. The symptoms of COVID-19 infection may appear 5.2 days after infection. COVID-19 symptoms include fever, coughing, sore throat, muscular pains, and loss of smell or taste.

At this time, data shows that SARS-CoV-2 can be transferred via droplets generated during coughing and sneezing, intimate contact with patient spatters, and aerosol droplets. Furthermore, the presence of virus particles in faeces, the digestive system, saliva, and urine suggested that the gastrointestinal tract might be another channel of transmission for this pandemic.

For example, it has been reported that viral RNA was found in stool samples from 39 of 73 COVID-19 positive individuals. They established a clear link between ACE-2 protein expression in rectal epithelia, duodenum, and stomach cells and the presence of SARS-CoV-2 nucleocapsid protein, suggesting that those components are involved in viral infection.

Surprisingly, the viral nucleocapsid was not found in esophageal epithelial cells where ACE-2 protein genes were not expressed. To the best of our knowledge, ACE-2 protein receptors are responsible for SARS-CoV-2 attachment to host cells, and they are often found in lung epithelial cells. Uno (2020) reported in another study that the risk of gastrointestinal tract infection caused by SARS-CoV-2 is greater in persons with higher pH in their stomach, particularly those with intestinal metaplasia and atrophic gastritis. As a result, the presence of viral RNA in patient's faeces suggests that the fecal oral transmission route is feasible. There is no evidence of COVID-19 transfer in breast milk as of yet. Unheated milk should be avoided during the epidemic due to the risk of cross-contamination from contaminated products.

Furthermore, not only may thermal processing at each temperature time combination be insufficient for viral particle inactivation, but due to the stability of SARS-CoV-2 at 20°C for up to 2 years, some frozen milk products such as ice cream may be considered as a carrier for the novel coronavirus pandemic.

Because of the possibility of food contamination *via* carry over or carry through routes, the probable fecal oral transmission route should not be ruled out. The detection of a new coronavirus on frozen chicken wings from Brazil has resulted in the first detection of SARS-CoV-2 on actual foods.