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Dato for henvendelse	Dato for svarfrist	Dato for afsendelse	Versionsnummer
29. juni 2020	30-06-2020		

Journalnummer/sagsnummer	FVST	KU	SSI
	2020-14-81-01772	061-0121/20-3680	20/xxxxx

## Besvarelse vedr.

### Vurdering af artikler om smitte til og fra svin med COVID-19

#### Bestilling

##### ► **Beskrivelse af bestilling (opgaveformulering, formål, afgrænsning)**

► På baggrund af debatindlæg i Politiken af Hans Jørn Kolmos, ønskes en vurdering af risikoen for smitte med COVID-19 mellem mennesker og svin, på baggrund af den artikel, der ligger til grund for indlægget

##### **Baggrund/kontekst for bestilling (hvorfor, til brug for hvad)**

Kolmos skriver: "Svin bør inddrages i overvejelserne på linje med mink. Det var budskabet i en artikel publiceret i sidste uge i det anerkendte videnskabelige tidsskrift Lancet Microbe"

Det ønskes vurderet, om det giver anledning til at revidere jeres besvarelse af 2. april 2020 (KU j. nr 061-0084/20-3880; SSI j.nr. 20/02487) om risikoen for smitte til/fra svin. Hvis ja bedes en revision af den oprindelige besvarelse udarbejdet.

#### Svar

1) ► Hans Jørn Kolmos has suggested a re-evaluation of the risk posed by the spread of infection between humans and pigs and written that: "pigs should be included in the considerations in line with mink. That was the message of an article published last week in the renowned scientific journal Lancet Microbe".

2) The article in the Lancet Microbe by Santini & Edwards

([https://www.thelancet.com/journals/lanmic/article/PIIS2666-5247\(20\)30069-0/fulltext](https://www.thelancet.com/journals/lanmic/article/PIIS2666-5247(20)30069-0/fulltext)) is a

"Comment", it does not provide any data. The key text is:

“Conflicting experimental studies were reported for pigs, where a SARS-CoV-2 inoculation showed no infection, whereas the virus was found to infect HeLa cells expressing the pig ACE2 receptor. The latter study is supported by all three computational model predictions of infectivity in wild boar and pigs.”

- 3) This text is misleading and shows a lack of understanding of how viruses interact with their host. It is indeed correct that the primary interaction between a virus and a cell is at the level of the receptor, located on the cell surface. However, there are many other interactions between the virus and its host cell that must also be functional for virus replication and productive infection to occur. For the SARS-CoV-2 (as for the SARS coronavirus), the cellular receptor is the ACE2 protein. Based on computational modelling and also limited experimental studies using human HeLa cells as the host, the ACE2 protein from certain species (e.g. humans, horseshoe bats, civet cats) was shown to be a functional receptor for SARS-CoV-2 and allowed the infection of the HeLa cells (Zhou et al., 2020). However, it is not at all surprising (and certainly not “conflicting”) that certain species (e.g. pigs) can be resistant to infection by SARS-CoV-2 despite having a functional ACE2 receptor protein (Beer, 2020; Shi et al., 2020). Two independent experimental studies have shown that pigs are resistant to infection by direct inoculation of the SARS-CoV-2 virus and there have been no reports of SARS-CoV-2 infection in pigs despite the widespread interaction between people and pigs. In general, coronaviruses are very host species specific and they do not easily switch from one species to another but sometimes this happens.

## References:

Beer, M., COVID-19: Experimental infection of fruit bats, ferrets, pigs and chicken with SARS-CoV-2 at Friedrich-Loeffler-Institut, ProMed Update, 2020-04-07 17:39:16; <https://promedmail.org/promed-post/?id=7196506>

Shi, J., Susceptibility of ferrets, cats, dogs, and other domesticated animals to SARS–coronavirus 2, 206 Science 10.1126/science.abb7015 (2020).

Zhou, P., Yang, X., Wang, X. et al. A pneumonia outbreak associated with a new coronavirus of probable bat origin. Nature 579, 270–273 (2020). <https://doi.org/10.1038/s41586-020-2012-7>

