

## Mutation of Sars CoV-2 in Danish mink and precautionary measures

Press Release from the French National Academy of Medicine and the Veterinary Academy of France

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The risk of epizootic spread of SARS-CoV-2 in mink farms and the fear of human contamination from this animal reservoir, mentioned in the biacademic press release of 20 July 2020 [1], have just been confirmed in Denmark. The discovery of two viral mutations of Sars CoV-2 in 5 mink farms and the transmission of the mutated virus to 12 people has led the Danish health authorities to decide the immediate slaughter of all mink raised on its territory, i.e. nearly 17 million animals. This decision, which has serious economic consequences for the world's leading mink skin exporter, was taken to prevent the spread of a new virus that could compromise the development of vaccine candidates against Covid-19 due to the reduced protective efficacy of human antibodies against the mutant virus [2]. In veterinary medicine, experience with vaccination against the coronavirus of avian infectious bronchitis (AIB) enlightens the Danish government's decision. The first coronavirus disease, described as early as 1931, AIB has been a real scourge for laying hens farms, the fall in the rate of egg-laying without mortality causing major economic losses in poultry farming. As the implementation of biosecurity measures is not sufficient to control this highly contagious disease, only vaccination can effectively prevent it. It is applied worldwide for laying hen flocks. The vaccine initially used corresponded only to the Massachusetts serotype. Then "variant" viruses appeared, carrying a mutation in the gene encoding the S1 spicule glycoprotein of the virus. The AIB's epidemiological surveillance has made it possible to identify "variant" viruses that may circulate in the same farm and to adapt vaccination programs using recombinant vaccines corresponding to the new viruses involved.

In the case of Danish mink, the two mutations of the gene encoding the S1 protein of Sars CoV-2 that present a potential public health risk were reported as early as September 4 by the Copenhagen Statens Serum Institute [3]. This plasticity of the S1 protein gives the virus a decisive advantage in crossing the species barrier [4]. It justifies the surveillance of viruses isolated from animals, especially mink, since it is the only species for which Covid-19 transmission from animals to humans has been observed.

In light of these findings and in support of the Danish government's decision to eliminate all mink farms to avoid human contamination and any risk of further spread, the French National Academy of Medicine and the Veterinary Academy of France recommend, as part of a global "one health" strategy:

- to strengthen the epidemiological surveillance of animal coronaviruses, particularly in mustelids (mink and ferrets) in order to detect early the formation of reservoirs;
- to ensure that the slaughter of mink has stopped permanently the spread of the variant virus isolated in Denmark;

- to detect any mutations among CoV-2-CoV-RASS isolated from animals, particularly mink, which may limit the effectiveness of future vaccination against Covid-19 ;
- to implement the most stringent biosecurity measures in mink farms that are still free in other countries;
- to avoid contact between people potentially infected with SARS-CoV-2 and their pets, especially ferrets, and observe the same barrier measures as for people around them (wearing masks, hand washing).

[1] Presse release from the French National Academy of Medicine and Veterinary Academy of France "Do animals infected with SARS-CoV-2 represent a risk for humans", 23 July 2020

[2] Covid-19 mass slaughter after a threatening mutation of the virus in mink in Denmark. AFP dispatch of 4/11/2020 (17h10)

[3] <https://www.information.dk/telegram/2020/10/myndigheder-rugede-paa-viden-coronamutationermink>

[4] Leroy E et al. Covid-19 transmission to pets: a risk not to be neglected. Bull Acad Vét de France 2020; <http://www.academie-veterinaire-defrance.org/>