Rapid opinion 03-2021 of the Scientific Committee established at the FASFC on a renewed risk assessment of SARS-CoV-2 infection associated to mink holdings

Terms of reference

The Scientific Committee is requested to provide an update of its rapid opinion 19-2020 on the risks associated to SARS-CoV-2 infection in mink holdings considering the development of the Covid-19 pandemic in humans and the particular situation observed in mink holdings in Denmark.

More specifically, the following questions are asked:

- What is the current risk of SARS-CoV-2 introduction into mink farms and further spread in Belgium?
- What is the current zoonotic risk for mink farms in Belgium?
- What management options can be proposed to mitigate the risk of SARS-CoV-2 introduction, spread and transmission to humans associated to mink holdings in Belgium?

Method

The assessments are carried out on the basis of expert opinion, data from the scientific literature, recent risk assessments on the subject of this opinion emitted by the OIE and the ECDC, the results of active monitoring in the 8 mink farms operational in Belgium in the beginning of December 2020, experience with mink holdings in the Netherlands and the conclusions and recommendations already available in the urgent opinion 04-2020 and the rapid opinion 19-2020 of the Scientific Committee.

A qualitative assessment was carried out considering :

- the likelihood of SARS-CoV-2 introduction into mink farms and further spread;
- the potential consequences of the SARS-CoV-2 introduction and spread in minks;
- the likelihood of human infection with SARS-CoV-2 via minks;
- the potential consequences for human health of zoonotic infections related to minks.

A level of uncertainty related to the weight of scientific evidence available in the literature was associated with each of the assessments.

Conclusion

Mink are highly susceptible to SARS-CoV-2 infection.

Considering the SARS-CoV-2 pandemic in humans, multiple introductions into mink holdings have been reported in many countries.

After introduction, SARS-CoV-2 infections spread very easily into a mink holding via the airborne route. Spread to other farms is possible via infected personnel (mainly by personnel who take care of the minks, but also potentially by any other person who comes into contact with minks, such as the practitioner).

Only a small number of mink holdings remain in Belgium. At the beginning of December 2020, there were still 8 farms active. These farms suspended their activities at the end of December 2020. When these farms are fully occupied, about 150,000 minks can be kept. When active, these farms are each potential sources of SARS-CoV-2 infection. In these densely populated farms, the virus can easily mutate during successive replication cycles. Due to the production method (one cycle per year with slaughter of the majority of animals for fur harvesting at the end of each year), it is possible that with each new production cycle the virus is reintroduced into a new, largely immunologically naïve population.

The introduction and spread of SARS-CoV-2 infection into mink holdings poses increased risks to public health. These consequences should be taken into account when managing infected mink holdings.
The following table summarizes the assessments of the likelihood of introduction and spread of SARS-CoV-2 infection into mink holdings as well as zoonotic infections and their potential environmental and public health consequences..

	Assessment/identification	Note
Likelihood of SARS-CoV-2 introduction into a mink holding	'High' via a SARS-CoV-2 infected human being during periods of limited contact 'Very high' via a SARS-CoV-2 infected human being during periods of intensive contact (mating, births, vaccination, fur harvesting).	The likelihood of introduction via other transmission routes is assessed as 'very low'
Likelihood of SARS-CoV-2 spread within a mink holding	'Very high'	
Likelihood of SARS-CoV-2 spread between mink holdings	'High' to 'very high' via infected human beings	The likelihood of spread via other transmission routes is assessed as 'very low', even when human beings are a passive vector of infection.
Consequences for the SARS-CoV-2 introduction and spread into mink farms	For public health : - the risk of infection for the not yet infected staff; - the creation of an animal reservoir (mink) for the virus; - the contamination of mink fur; - the emergence of virus strains adapted to mink by genetic evolution with the appearance of potential escape mutant. For the environment and wildlife : - the escape of infected minks into the wild and the establishment of wild reservoirs; - the contamination of by-products from mink farming.	The Scientific Committee points out that, so far, very little evidence has been provided for the existence of escape mutants. The severity of these potential consequences has not been qualitatively assessed by the Scientific Committee.
Likelihood of SARS-CoV-2 zoonotic infection via mink	- 'Very low' for the general population ; - 'High' for the more exposed categories of the human population (e.g. farmers, their families, farm staff, veterinarian); - 'Very high' during certain periods when there is more contact between the staff and	

	the minks (mating, births, vaccinations, fur harvesting).	
Potential consequences of SARS-CoV-2 zoonotic infection via minks	- changes in the pathogenicity of the virus; - changes in the ability to spread to and between other animal species; - changes in the antigenicity of the virus which may have an impact on vaccine efficacy, on the use of hyperimmune sera or on natural immunization; - modifications altering the sensitivity of diagnostic tests.	However, the Scientific Committee underlines the current lack of evidence for all these potential consequences. The seriousness of these potential consequences has not been qualitatively assessed by the Scientific Committee.

Recommendations

In Belgium, the risks of SARS-CoV-2 infection of minks via humans, of transmission between animals and of zoonotic infection are currently eliminated as all mink holdings have ceased operations since the end of December 2020.

As long as SARS-CoV-2 circulates as a pandemic in humans and particularly in Belgium, the Scientific Committee recommends that these activities should not be resumed under any circumstances. The definitive ban on mink farming in Belgium is in any case foreseen on the 1st of December 2023.

If any case of SARS-CoV-2 infection should be found in the future in a Belgian mink holding (in case some holdings restart their activities), the Scientific Committee recommends :

- The regular testing of all personnel working on mink holdings to prevent people who are SARS-CoV-2 positive from coming into contact with mink ;
- the wearing of personal protective equipment to prevent the introduction of the virus by infected workers;
- vaccination of the staff of the holding;
- more regular serological tests on mink (e.g. every 3 weeks) to detect more rapidly an asymptomatic spread between animals or to compensate for a lack of sensitivity of the monitoring based on virological analyses on dead animals from the farms only;
- the testing of any mink entering the holding, whether or not accompanied by a health certificate at the time of import, and the proper quarantine of this animal while awaiting the results of the test;
- the reinforcement of internal and external biosecurity on farms to limit the risks of introduction, spread and zoonotic risk, as well as to limit animal contact from outside and to prevent mink escaping;
- in a positive holding :
    - o immediate euthanasia of all animals in the holding ;
    - o rapid treatment (disinfection) or rapid destruction of products (furs), this being carried out with protective equipment, as well as rapid destruction by incineration of the carcasses ;
    - o the treatment of by-products (manure, mink carcasses after fur harvesting);
- regular testing of mustelids likely to be recovered in revalidation centers in order to avoid the risk of transmission into wildlife and the establishment of a wild reservoir;
- monitoring of mustelid populations in the Belgian wildlife;
- research programmes aimed at determining and characterising the impacts of the genetic evolution of SARS-CoV-2 in animals and the efficacy of the oral/food route for the infection of animals.

The full text is available on this website in dutch and in French.