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Subject Advice regarding 75th  
OMT-Z

Dear Ms Sonnema, dear Ms Beens,

On 20 August 2020, the Centre for Infectious Disease Control (CIb) of the National Institute for Public Health and the Environment (RIVM) convened the Outbreak Management Team for Zoonoses (OMT-Z) to provide advice on the situation relating to COVID-19 in mink.

## **A. Reason for convening OMT and objective**

The OMT-Z has once again been asked for advice in connection with the potential public health risks of mink farming. On 17 July 2020, the OMT-Z indicated that if at mid-August there were new infections and if the human epidemiological situation remained unchanged, preventive culling of mink farms would be on the table as an option for cutting off potential reservoir formation in the mink farming sector.

Since the last OMT-Z, SARS-CoV-2 infections have been identified at 12 mink farms and/or their locations, with a number of those being identified after mid-August. This means that despite the supplemental measures in July, new infected farms continue to be identified.

The following will provide a brief summary of the situation and the recommendations of the OMT-Z.

## **B. Current situation**

### **Background**

From April up to 19 August, SARS-CoV-2 infections were identified at 35 mink farms and/or their locations, in response to which culling was carried out at these locations. The Ministry of

Agriculture, Nature and Food Quality (LNV) instituted a transport ban on mink and manure, and also imposed a more rigorous hygiene protocol and a ban on visitors. An additional measure imposed was that dogs and cats at a mink farm (even if it has been cleared) now have to be strictly confined to these locations. Additionally, employees with symptoms that could indicate COVID-19 have been urged to not come into contact with the mink and to get tested as soon as possible; employees without symptoms have been advised to use non-medical face masks when performing activities involving contact with the mink.

Despite supplemental measures in July, the number of new infected farms has continued to increase even after mid-August, as was demonstrated by means of a reporting obligation and Early Warning (weekly testing of cadavers).

## **C. Recommendations in response to questions**

**What is your assessment of the situation with respect to the infections among mink since the previous recommendations of 17 July 2020?**

**Is there an improved understanding of the sources of infection for the infected farms and the routes of transmission? If so, what are the options for cutting off these routes?**

Since the previous OMT-Z, the number of infected mink farms has increased from 23 to 35. There are still 5 different virus sequences at the affected farms; there are no indications that new sequences have emerged since the previous OMT-Z. This indicates that there has been no introduction of new virus sequences from humans into the mink farming sector. Of these 5 sequence types, three of them have been found at multiple companies (clusters). It must be noted here that sequence analysis has not yet been performed for eight companies at which the infection has only recently been identified.

Nearly all of the infected farms are established in the same region as the companies where previous infections with SARS-CoV-2 in mink were observed: the province of Noord-Brabant and the northern part of the province of Limburg. In one case, the farm was situated in the southern part of the province of Gelderland; however, that farm has the same owner as a number of other infected locations.

To the best of our current knowledge, the findings among the animals on the 12 new infected farms since the previous OMT-Z are consistent with infections that have occurred relatively recently. This indicates that the measures implemented in response to the previous OMT-Z have been inadequate in preventing new infections among mink in the area of Noord-Brabant and Limburg.

The research into the transmission route of SARS-CoV-2 among mink farms is currently in full swing. On the basis of results so far, a number of transmission routes have been determined to be less likely. There are no indications of infection routes via feed, vehicles, pets, wildlife, materials used at the farms, or via an airborne route. This means that humans remain the most likely significant source of transmission between the farms. Unfortunately, it has proved impossible to produce a comprehensive overview of the contacts between the companies, due to incomplete records of persons who have been on the properties (in particular prior to 10 July; but even after that date the records proved to be inadequate). Another factor is that temporary workers are unreachable in some cases, which makes an investigation of the possible connections between the companies through these persons more difficult. An additional point that needs to be considered is that privacy legislation prevents the exchange of personal data for employees on mink farms between Municipal Public Health Services (GGDs) and the Netherlands Food and Consumer Product Safety Authority (NVWA). Although the contacts between the farms through persons cannot always be traced because of all this, there are nonetheless clear examples of contacts between the various operating locations, such as in the form of exchanges of personnel.

This transmission route could potentially be cut off by assigning a fixed linkage of employees to a farm at each location, so as to prevent any further exchange of employees between farms. Enforcement of compliance with such a rule would be critical.

It is always important to ensure that employees with symptoms have easy access to tests, i.e. get tested quickly, by the GGD, and that employees of an infected mink farm are all tested (for the purposes of cluster investigation). When that happens, the GGD can perform source and contact tracing and use sequence analysis on positive samples to map out the spread of the virus.

**Can you explain what you mean by reservoir formation in the mink farming sector?**

Reservoir formation in the mink farming sector occurs when a certain genetic variant of a virus occurs persistently on a mink farm, and transmission continues despite preventive measures. As of this writing, there are three such clusters to be found among the farms, which confirms that reservoir formation is occurring.

**To what degree are the current measures (notification obligation and active surveillance, plus culling of infected farms) reducing the risk of reservoir formation?**

The continuing incidence of new infections on mink farms even after mid-August demonstrates that the measures implemented so far are inadequate to break the infection chains on and between mink farms, and thus are therefore inadequate to prevent reservoir formation.

**How significant do you consider the risk to public health from farms infected with SARS-CoV-2-infected? Can you substantiate this, taking into account the current situation of the human epidemic?**

**Can you give recommendations on the measures to be taken in order to minimise the risks to public health?**

Persons in contact with infected mink run a risk of becoming infected with SARS-CoV-2. Of the 88 human contacts on infected mink farms tested, 43 were positive (49%), although it must be noted that not everyone was tested and that it is not clear whether all these persons became infected via mink or via other people. This makes the risk of becoming infected on an infected mink farm higher than in a household situation; the risk of a case among contacts of a confirmed index within a household is approximately 15-20%. The reason for this difference may be related to exposure to a high virus concentration in the sheds and cages. It has also been shown that it is difficult for the employees to use personal protective equipment (PPE) properly during the work.

Where whole genome sequencing has been possible, infected employees have always been shown to have the same virus sequences as the mink on the infected farm in question. The analysis of sequences from COVID-19 patients in the region where these farms are established has shown that these sequences have not yet been found among people outside the mink farms. In a few cases, the sequence was found in a person who proved to be a direct contact of an employee of a mink farm. This is an expected outcome, because human-to-human transmission of the virus is possible. It is therefore extremely important that the GGD is able to perform a thorough source and contact tracing process on any infected employee. Placing the infected employee in isolation during the period in which the virus is contagious and keeping the employee's household and other close contacts in quarantine could be a way of breaking the chain of human transmission. This requires the cooperation of the infected employees, and it is essential that all employees of infected farms are part of this process and are available to the GGD for testing so that the GGD can conduct the source and contact tracing process if required.

The risk to neighbouring properties is negligible, as has been shown from air samples taken outside the sheds, the fact that the virus sequences of patients from postcode areas around the infected farms are non-identical, and the recent epidemiological status of COVID-19 patients in the regions where the infected mink farms are found: in these areas, the incidence of COVID-19 among the population is currently relatively low. Additionally, as already stated, so far the sequences circulating among the mink have not been found in people outside the mink farms, with only one exception. From this we can conclude that the risk of transmission from mink is currently negligible for people living outside the environment of the mink farms as compared to the risk of person-to-person infection among the general population.

The OMT-Z considers it worrying that it has proven impossible to get the transmission of the virus among the mink farming sector under control. The continuing spread of the virus to and from people is primarily a risk to employees of these farms. Although there are currently no indications of secondary transmission on a widespread scale, this could be happening at the individual level among the contacts of the employees.

Despite the risk to public health, which can for the time being be characterised as limited, stopping the transmission of the virus within the mink farming sector remains an important goal, in part because there is still a great deal of uncertainty about the transmission route. It is undesirable to allow the virus to continue to circulate among mink farms (reservoir formation), which could in the longer term present a risk of secondary transmission via employees of these farms to the general population.

The OMT-Z reiterates its previous recommendations that if the infection pressure among the population continues to decrease in the near term, and human-to-human transmission occurs relatively less frequently, the importance of preventing mink-to-human infection increases. Mink currently form a reservoir for the virus and could therefore remain a continuing source of infection for humans, and thus present a source of reintroduction of the virus into the population from the farms. Given that the preventive measures for cutting off spread to mink farms have not produced the desired result, the OMT-Z is of the opinion that the recommendations issued previously should remain in place, namely that the practice of mink farming in the Netherlands should be ended.

In its previous recommendations, the OMT-Z indicated that if the infections of mink farms are not stopped by the measures being proposed, then preventive culling would be the only remaining option to stop reservoir formation in mink farms. Preventive culling is, however, not only a very drastic measure, but also an extremely large-scale and time-consuming logistic operation because of the strict requirements with regard to animal welfare and the safety of the persons involved. Research since the last OMT-Z has demonstrated that there are no alternatives to the present method of killing that would speed up the culling process while still meeting animal welfare requirements. The capacity for culling farms would seem to be currently just sufficient to cull all the infected mink farms, but scaling up to additional preventive culling of non-infected farms would take a great deal of time, potentially more than six months. This means that if the decision to initiate preventive culling is made, the culling at some of these farms could only happen after the period of the annual pelting (in November). This would obviously be undesirable, because the SARS-CoV-2 virus will most likely continue to circulate in the Netherlands in 2021, so the risk of infection on mink farms would continue to exist. This is why the OMT-Z does not consider preventive culling to be the most effective method of stopping reservoir formation in the mink farming sector.

The OMT-Z's preference is therefore to:

1. cull infected mink farms;
2. step up screening of farms in combination with better management of personnel (see below);
3. institute a mandatory stop scheme for mink farming in the Netherlands after the pelting period in November of this year.

The OMT-Z recommends maintaining the current measures up until the pelting period this year, with an additional measure preventing exchange of personnel between the mink farm locations. There must also, at a minimum, be an effective registration of employees at each farm. Tracing SARS-CoV-2 among mink remains extremely important, and the Early Warning System is a crucial part of this. This may, for example, take the form of increased screening by means of more extensive random sampling among suspect farms, increasing the minimum number of dead animals in the Early Warning, analysis of faecal samples and/or hanging of fabric swaths in the sheds in order to detect the virus in a timely manner.

All farms, even those not infected, must cease operating definitively by the end of 2020, which means that a good protocol for the pelting of the animals must be put in place to provide assurances that the employees involved will not be exposed to SARS-CoV-2 (or at least that the risk of exposure will be minimised). Finally, the export of mink for fur or breeding must be prevented.

The OMT-Z considers this the best option, because the public health risk to neighbours and the rest of the population in the short term is very small, as indicated above, and this is the fastest way to cut off the public health risk in the longer term (reservoir formation and resulting infections). With this strategy, the long-term risk can be eliminated; according to the information provided to the OMT-Z, this strategy is also the best approach for achieving this as quickly as possible.

### **Which mink farms have an increased risk of becoming infected with SARS-CoV-2? Can you explain this?**

Up to this point, only farms "south of the rivers" (including the farm just above the Meuse) have been infected. This may change in the near future, because there is still a risk of the virus being brought in by people elsewhere.

Because the most likely transmission route between farms is via people, and employees on infected farms become infected relatively often, the exchange of employees between companies or between different locations of a single company constitutes a risk. Therefore, companies that hire temporary employees who have also worked on other farms are at an increased risk of infection.

**If there are differences between farms, does it make sense to come up with a different package of measures for each region? Is a regional approach to measures a possibility for reducing the risks to public health and, if so, can you explain the region or regions in which such measures should be implemented in order to achieve this?**

Although the infections are currently concentrated in one region, there is theoretically nothing stopping transmission from humans to mink on farms in other regions. For this reason, the OMT-Z is recommending that the measures outlined above are implemented on all mink farms in the Netherlands.

To sum up, the preferred strategy for eliminating the risk of reservoir formation in the mink farming sector, and the continued transmission into the human population, is:

- more rigorous screening of farms in combination with better management of personnel (linking employees to farms, keeping records of personal data, and testing after exposure, and in the event of symptoms);
- continuation of the culling of infected farms;
- stopping all mink farming operations after the pelting at the end of this year.

I am available to provide additional verbal explanation of the recommendations.

Yours sincerely,

Professor J.T. van Dissel, PhD  
Director of the Centre for Infectious Disease Control (CIb)