



# Fur Farming, COVID-19 and Zoonotic Disease Risks

## Executive Summary

*Since April 2020, when the first case of COVID-19 in American mink was confirmed on a fur farm in the Netherlands, this zoonotic disease has continued to rage throughout farmed mink herds in various EU Member States as well as in the United States. In some countries, this has led to the preventative culling of millions of animals; while, in others, the government authorities have only required the implementation of biosecurity measures to try to prevent further transmission.*

*As this white paper will outline, the wisdom of not taking measures to eradicate potential reservoirs of SARS-CoV-2, the virus that causes COVID-19, has been brought into question by the discovery that this coronavirus can jump back and forth between mink and humans. Viral genome sequencing has shown that infection in mink can lead to dangerous mutations of the spike-proteins which, if transmitted to human populations, could potentially undermine the efficacy of the vaccines that are needed to end this global coronavirus pandemic.*

*Fur farming thus poses a serious risk to human health. This is the key reason why Denmark has taken the radical step of culling its entire mink herd after a quarter of its 1147 fur farms were found to*

*have been affected. It is also why the Netherlands forced an early shutdown of its industry, which was already due to be phased-out by 2024.*

*Additionally, the outbreaks of COVID-19 on mink farms have drawn public attention to the fact that fur is produced - solely to supply the frivolous needs of the fashion trade - by intensively confining wild animals in small wire cages in close proximity with one another. Factory farming mink and other fur bearing species is an inherently inhumane practice.*

*Animals on fur farms suffer from chronic stress and poor welfare, which can compromise their immune responses. Mink, in particular, are susceptible to respiratory diseases and SARS-CoV-2 has spread virtually unbridled in this cruelly farmed species.*

*The present paper charts the spread of COVID-19 in mink. It explores the relationship between the intensive confinement of wild animals for fur production and the risk of zoonotic disease. Given the animal suffering and public health risks posed by this non-essential industry, Humane Society International strongly advocates a permanent end to breeding, keeping and killing animals for the purposes of fur production.*

## Introduction

On 31<sup>st</sup> December 2019, China notified the World Health Organisation (WHO) of the emergence of a deadly new coronavirus, which was given the name SARS-CoV-2. Within a mere couple of months, a global pandemic ensued as this zoonotic disease (i.e. a disease that is transmissible between animals and humans) began to spread across the world.

COVID-19, as the disease caused by SARS-CoV-2 became known, has not only led to millions of human infections and over 1.3 million deaths,<sup>1</sup> but has also had a devastating impact on the economy

and people's everyday lives, since it has ripped through the very fabric of human society.

The emergence of this novel coronavirus has also raised serious questions about the impact of human interactions with and exploitation of other species. During the initial outbreak, most human cases were traced back to a wildlife market in the city of Wuhan, Hubei province, China. SARS-CoV-2 is thought to have originated in bats and may have passed through an (unknown) intermediate animal host animal before acquiring the ability to infect people.<sup>2,3</sup>

This is not the first, and will undoubtedly not be the last, newly emerging pathogen to jump the species divide and cause disease in human populations. In recent years, we have borne witness to outbreaks of severe acute respiratory syndrome (SARS), Ebola, Middle East respiratory syndrome (MERS) and the highly pathogenic avian influenza (HPAI) in humans.

While a small fraction (less than 14%) of all recognised human pathogen species are viral (others are bacterial, fungal, prions etc.), almost 75% of newly discovered pathogens have been viruses,<sup>4</sup> including the 2020 COVID-19 pandemic. Indeed, a systematic review published in 2015 found that 91% of zoonotic viruses can originate from wildlife, 34% can originate from domestic animals, and 25% may originate from both wild and domestic species.<sup>5</sup> Transmission goes both ways and people can spread disease to animals as well,<sup>6</sup> for example human influenza A viruses can infect pigs.<sup>7,8</sup> Given their close proximity, humans share more viruses with animals kept for production purposes than with wildlife.<sup>9</sup>

The present report will examine the potential zoonotic disease risks posed specifically by intensively exploiting animals for the purposes of fur production. It will explore how keeping animals

on fur farms - under inherently poor animal welfare conditions - can lead to these animals serving as immediate, intermediate, or amplifier hosts for viral pathogens with a pandemic potential. One of the greatest concerns is that keeping animals of a very similar genotype in close proximity to one another under poor animal welfare conditions is a recipe for disaster.

As outbreaks of COVID-19 on mink farms in both Europe and the United States have clearly demonstrated, it is possible for viral pathogens to jump back and forth between humans and animals bred for fur. Mustelid species appear to be particularly susceptible to respiratory diseases, which partly explains why farmed mink were vulnerable to infection with the SARS-CoV-2 virus.

The outbreaks of COVID-19 among mink herds has not only led to the preventative culling of millions of mink since the first case was identified in the species in the Netherlands in April 2020, but has also raised serious concerns about the existence of a reservoir of SARS-CoV-2 and genetic mutations in the virus as a consequence of infection in mink could affect our ability to halt the spread of and eliminate the disease and may undermine the efficacy of any future vaccine. This will be further discussed below.

## Species kept for intensive fur production

The vast majority of commercially produced animal fur today comes from wild animal species that are intensively bred and killed on farms. American mink (*Neovison vison*), red fox (*Vulpes vulpes*), Arctic fox (*Alopex lagopus*) - as well as bred hybrids of these two fox species - raccoon dogs (*Nyctereutes procyonoides*) and chinchillas (*Chinchilla chinchilla*) are the main species that are commercially exploited for their fur.

The aforementioned species are wild animals, even chinchillas only started to be deliberately bred for fur in the 1920s.<sup>10</sup> Contrary to fur industry claims, American mink, fox and raccoon dogs are not domesticated animals, certainly not in the same way as other farmed species, such as cattle, pigs, sheep and poultry species, which are all herd or flock species that have undergone a few thousand years of selective breeding. In comparison, fur-bearing species have only been kept and bred in captivity for a relatively short space of time.

Although these animals were long hunted and trapped for their luxurious pelts, it was only during the mid-nineteenth century that the first attempts to breed captive animals for fur began in North America. American mink were deliberately bred from the 1860s onwards, while foxes are believed to have been first confined to farm cages in 1895 in Canada.<sup>11</sup>

Fur farming only began in Europe during the 1930s, primarily exploiting species that had been imported from the Americas. Some of these species, such as muskrats and coypu, failed to sufficiently thrive and/or produced poor quality fur in captivity and many individuals were subsequently released into the wild. Populations of these non-native species were able to establish themselves and they are now commonly regarded as invasive alien species given their impact on native biodiversity and the economic damage that they are deemed to cause.<sup>12,13</sup>

For a long time, selective breeding of fur-bearing animals was focused primarily on the pelt quality, physical size and producing colour variations, rather than necessarily on the behavioural traits that would better enable them to cope with life in captivity. While mink, foxes and raccoon dogs kept on farms do differ in some respects to their wild conspecifics, these species all retain very strong desires to range, dig, forage for food and engage in social and breeding behaviour. In the case of mink, this species has additional needs to access water for swimming, hunting prey and to regulate their body temperature.

The relatively short period of time that these species have been farmed, has led animal welfare experts to conclude that “it [is] highly unlikely that all of their requirements for good welfare in captivity will have been identified”.<sup>14</sup> Below the impact of poor animal welfare will be discussed in greater detail.

In addition to the aforementioned species, in the past, another mustelid species, namely ferrets (*Mustela putorius furo*) - the domesticated variant of the European polecat - were also bred for fur and were referred to as ‘fitch’ specifically for this purpose.<sup>15</sup> Ferret farming has never been a widespread activity, probably because breeding these animals for the pet trade is more lucrative,

and it is not known whether ferrets are still being kept and killed for their fur.

Coypu (*Myocastor coypus*), a South American rodent species also known as nutria, and muskrats (*Ondatra zibethicus*), which are native to North America, were also once bred for fur, but – as noted above - these two rodent species did not reproduce well in captivity.

Further to this, some breeds of the domesticated rabbit (*Oryctolagus cuniculus domesticus*), such as Rex and Orylag rabbits, are also commercially bred primarily for their pelts, which strongly resemble chinchilla fur. Their meat is a secondary product.

It should, however, be noted that most rabbits bred on European farms for meat are from completely different breeds, such as the Californian white and New Zealanders. Their pelts are not commercially interesting to the fur industry given that the animals are generally slaughtered when they are moulting and their pelts are not homogenous.<sup>16</sup> Rabbit furskins are, therefore, generally considered to be a waste product in the European rabbit meat industry, which are either disposed of, or used as a material in the felt-making industry where they are used for making high-quality felt hats.

## Animal welfare problems inherent to fur farming

The most commonly farmed fur-bearing species, mink and fox are carnivorous predators and are highly inquisitive, active animals with complex social lives. As noted above, unlike most other types of farmed animals, which tend to be flock or herd species, mink are solitary by nature. Mink and fox are both territorial species and, in the wild, go to great lengths to defend their territories. As will be further outlined below, these animals are unsuited to farming conditions and especially intensive breeding and rearing.

### Mink farming

In the wild, mink are extremely active and solitary animals, strongly motivated to range over large territories of several kilometres, to hunt by following scent trails, and to create, live in and investigate dens and burrows. As semi-aquatic mammals their territories include lakes and rivers, where they carry out key behaviours including swimming and diving for prey.<sup>17</sup>

The life that mink are condemned to on fur farms stands in stark contrast to this. The excessive energy of these animals is confined to cages and nest boxes typically measuring 90x30x45cm. Being naturally solitary animals, the stress of being forced to live in cages with siblings, without access to water for swimming, and next to neighbouring cages with completely unrelated mink, often leads to fighting, injury, instances of cannibalism and death.<sup>18,19,20</sup>

Stereotypical behaviour (such as pacing along the cage wall, repetitive circling/nodding of the head, etc.) and auto-mutilation (i.e. sucking or biting of the animal’s tail fur, or other parts of the pelts) is routinely observed in farmed mink. These unnatural behaviours provide a strong indication of stress and poor animal welfare.<sup>21,22,23,24</sup>

### Fox farming

Wild foxes can have a home range of 20-30km<sup>2</sup>, and can migrate over hundreds of kilometres

seasonally. Their habitat is rich and varied, allowing for key behaviours including hunting, territory establishment and den building, socialisation and mating. By contrast, foxes on fur farms live in battery cages of a typical size of 0.8-1.2m<sup>2</sup>. This space can in no way be described as meeting these animals' physiological or behavioural needs.<sup>25</sup>

These battery cages are barren with the exception, in some cases, of a wire shelf and/or an item for gnawing. The persistent lack of meaningful and varied stimulation and opportunity to practice normal behaviours often leads to stereotypical behaviours, repetitive movements that are indicative of a compromised mental state.<sup>26</sup> Injuries also occur as a result of fighting with cage mates, which is also a consequence of the stress of confinement.<sup>27</sup>

## Fur industry attempts at 'humane-washing'

In recent years, the fur industry in Europe has been keen to maintain that it is working to improve the welfare of animals on fur farms. To these ends, they have established the WelFur scheme.<sup>31</sup> This is an industry-led voluntary welfare certificate for fur farms, which in reality requires lower standards than the law in some EU Member States.

The truth is that the intensive battery cage systems that are found on fur farms in the EU have remained largely unchanged over the years. The WelFur programme, which is designed around the current housing systems and current minimum levels of European Union legislation (i.e. Directive 98/58/EC on the protection of animals kept for farming purposes and Regulation (EU) 1009/2009 on the protection of animals at the time of killing), offers neither satisfactory nor reliable solutions to the inherent animal welfare problems associated with fur farming.

For example, the WelFur criteria do not require access to swimming water for mink or sites for digging for foxes. As the ability to search for food in water (mink) and to dig (fox) are to be considered as natural behaviours and the motivation to carry out such behaviour probably is high, the WelFur criteria for the species in question do not meet their specific physiological and behavioural needs<sup>32</sup>.

Welfare problems have also arisen in fox from the fur industry's selective breeding animals to favour large body size and loose skin. In the wild, arctic foxes weigh in the region of 3kg. On fur farms they are reported to weigh in excess of 20kg – over six times the species' natural size<sup>28</sup>. This is done to increase the fur yield per animal, but it is important to note two undesirable consequences of this breeding.

The first is that these grossly overweight animals frequently suffer from a variety of long-term health problems, including infections at the site of skin folds, in particular around the eyes; deformed or 'bent' feet, and difficulty in moving around<sup>29</sup>. Secondly, while selective breeding has increased the size of fox, the cage sizes have remained the same, giving the overall result that over time these animals are being afforded less and less space, relative to their size<sup>30</sup>.

In addition, the WelFur evaluation scheme combines different welfare measures into an overall score for a farm. This practice obscures individual measures and therefore allows serious welfare problems and injuries to be masked. The aim of its scoring system is to rank farms in relation to each other and against "current best practice".

The WelFur protocol does not assess animal welfare in relation to an "absolute" welfare level, nor does it assess animal welfare on an individual animal level. The WelFur framework is not designed to provide reasonable assurances that individual animals will not suffer from poor welfare.<sup>33</sup>

Over the past few decades, the conditions on fur farms across the globe have been documented by animal protection organisations. Time after time this film footage shows the same kind of animal welfare problems that the industry claims it has been actively solving in the framework of the WelFur programme.<sup>34</sup>

Even the most recent images captured on European fur farms, which purportedly comply with fur industry welfare standards, reveal animals displaying stereotypical behaviour, self-mutilation, cannibalism, untreated wounds and so forth<sup>35</sup>. The conclusion that can be reached is that the fur industry's voluntary welfare standards are

not only inadequate, but may also be viewed as tantamount to 'humane washing'.

## Failures to achieve the 'Five Freedoms' for farm animal welfare

On the basis of veterinary analysis of footage from fur farms in Europe, HSI has concluded that the conditions under which fur-bearing species are kept do not even allow the basic 'Five Freedoms' for farmed animals to be met.

These five freedoms also form the basis for the World Organisation for Animal Health's (OIE) guiding principles on animal welfare, and are also codified as welfare needs in EU legislation, namely in Directive 98/58/EC on the protection of animals kept for farming purposes, as well as the Council of Europe's 1999 Recommendations Concerning Fur Animals.<sup>36</sup>

It should be noted that these Five Freedoms are today viewed by animal welfare scientists as the most basic obligations of those who keep animals, yet fur-bearing species kept on fur farms in intensive battery cage systems are not afforded even these freedoms, nor could they be said to have "a life worth living".

In October 2018, HSI and Finnish organisation Oikeutta Elaimille conducted an investigation on two Finnish fur farms, which have been certified by the European fur industry body as having 'high welfare'. Documentary evidence of the living conditions and the observable physical condition and behaviour of both mink and foxes was recorded and later subjected to veterinary analysis, which focused on the five freedoms and the implementation of Directive 98/58/EC. Table 1 provides an overview of the key findings.<sup>37</sup>

There is no doubt that there is clear evidence from this footage, of supposedly 'high welfare' certified farms, that none of the Five Freedoms are being met consistently. By implication therefore, the conditions are highly likely to contravene the guiding principles of the OIE, the European Directive 98/58/EC Concerning the Protection of

Animals Kept for Farming Purposes, as well as the Council of Europe's 1999 Recommendations Concerning Fur Animals.

This – and other fur farming footage – has also been analysed with respect to violations of EU Directive 98/58/EC concerning the protection of animals kept for farming purposes. This legislation lays down minimum standards for the protection of animals bred or kept for farming purposes, including for fur production.

Article 4 of the Directive states: 'Member States shall ensure that the conditions under which animals (other than fish, reptiles or amphibians) are bred or kept, having regard to their species and to their degree of development, adaptation and domestication, and to their physiological and ethological needs in accordance with established experience and scientific knowledge, comply with the provisions set out in the Annex.'

Based on the available scientific literature around the physiological and behavioural needs of fur farmed animals, HSI concluded that the fur farms studied do not meet the requirements of Article 4, most notably in relation to: a) the inadequate size of the cages; b) the lack of non-wire substrate to allow for key behaviours such as digging; and c) (in the case of naturally solitary and semi-aquatic mink) the lack of provision of water for swimming and lack of opportunity for animals to withdraw meaningfully from the presence of other animals.

Likewise, we found additional failures to comply with the terms of the legislation. For example, injured animals were evidently not being cared for appropriately, or placed in isolation with dry bedding as required by clause 4 of Directive 98/58/EC.

**Table 1: An analysis of five freedoms on Finnish fur farms**

The Five Freedoms		Key observations on animal welfare
1	Freedom from hunger and thirst, by ready access to water and a diet to maintain full health and vigour.	Many of the foxes in the footage are grossly obese as a result of being fed a diet in excess of their nutritional needs, particularly in relation to their close confinement in small cages. In addition, these animals are likely to suffer from numerous health conditions caused by their unnatural weight.
2	Freedom from discomfort, by providing an appropriate environment, including shelter and a comfortable resting area.	It is clearly apparent that the animals on both farms are kept in completely inadequate conditions for their species. The dirty dusty cages allow only minimal freedom to express many of their normal behaviours and give no opportunity to escape aggressive encounters with cage mates resulting in the severe wounds seen in the footage. Housing on wire floors, ubiquitous throughout the fur farming industry globally, will cause discomfort and pain. There is little if any sign of enrichment to provide even the most basic mental stimulation for these highly active and inquisitive species.
3	Freedom from pain, injury and disease, by prevention or rapid diagnosis and treatment.	There is ample evidence of frequent aggressive encounters resulting in severe wounds, such as the mink with an extensive bite wound involving loss of skin from much of its back and tail base. The wound was exuding serum and was grossly contaminated with bedding suggesting it had never been cleaned, dressed or protected. There is evidence of animals with eye infections, missing eyes, damaged or missing ears, and a fox with a large open wound on its side. Any injuries should require the swift removal of the animals from their cage to an isolation area and the provision of immediate veterinary treatment, there is no evidence of this having taken place. All of the arctic foxes are grossly overweight or obese which will undoubtedly cause a number of secondary conditions and poor health, such as those seen in the footage and including excessive skin folds, eye infections, and excessive weight on joints, leading to “bent” or deformed feet.
4	Freedom to express normal behaviour, by providing sufficient space, proper facilities and appropriate company of the animal’s own kind.	The small battery-style cages offer little opportunity for the animals to express even a minimum amount of their natural behaviour, which they will have a strong desire to do. Being housed in inappropriately close confinement with other animals has resulted in aggression leading to severe wounds and even death, as seen in the footage.
5	Freedom from fear and distress, by ensuring conditions and treatment which avoid mental suffering.	All the animals seen in the footage were living in dismal, cramped conditions, many in fear of aggression from cage-mates with little opportunity to engage in activities that they have a strong desire to carry out. They clearly do not lead lives worth living.

## Poor animal welfare increases susceptibility to infectious disease

As illustrated above, the living conditions in fur farms, which keep animals in close proximity and at high densities, fail to satisfy many of the animals’ most basic welfare needs.

Not only are these captive wild animals highly stressed and thus immunocompromised, but they are crowded into close contact with each other’s respiratory secretions and excrement.

Fur farms also often lack naturally mitigating factors, such as genetic variability and healthy

distance between animals. The animals are confined to small wire cages with bedding materials – as well as dried faeces that accumulate under the cages - that also generate a lot of dust.<sup>38</sup>

For these reasons, fur farms provide ample potential channels for diseases to propagate from one animal to another, and conditions in which viruses may genetically recombine into forms potentially virulent to humans.<sup>39</sup>

There is also already an unacceptably high level of mortality among animals kept on fur farms. This poses the risk that mortality due to infectious disease may not necessarily be detected.

The high density of animals on fur farms also means that it is difficult for workers to frequently monitor the health status of individual animals. Animals suffering from the symptoms of infectious diseases may, therefore, go unnoticed.

## COVID-19 outbreaks on mink farms

On 26<sup>th</sup> April 2020, the first case of SARS-CoV-2, the virus that causes COVID-19, in American mink was confirmed on two Dutch fur farms in Noord Brabant, a province that lies not only at the heart of the Dutch mink production industry, but also – at that point in time – at the epicentre of the COVID-19 outbreaks in the country.<sup>40</sup>

Since this initial outbreak, SARS-CoV-2 has continued to rage throughout farmed mink herds in various EU Member States. To date, the virus has been detected in mink on 289 mink farms in Denmark, 70 in the Netherlands, 13 in Sweden, 12 in Greece, 1 in Spain, 1 in Italy, 1 in France, 1 in Lithuania and a still undefined number in Poland. SARS-CoV-2 has also been detected on 16 fur farms in the US States of Utah, Wisconsin, Michigan and Oregon and on 1 in British Columbia, Canada.

It is noteworthy that these outbreaks on fur farms have persisted despite the mandatory and strict biosecurity measures supposedly having been taken by fur farmers to prevent the further spread of COVID-19 among their herds.

As will be illustrated below, the competent national authorities of each country whose fur farms have been affected by COVID-19 have varied significantly in their approach to stamping out the virus in mink.

### COVID-19 surveillance and testing regimes

It is also unclear what testing and screening regimes are or have been in place for both mink farm workers and mink in fur producing countries that have not yet reported any cases of COVID-19.

In Europe, it was only after the publication of the European Centre for Disease Prevention and Control's (ECDC) *Rapid Risk Assessment: Detection of new SARS-CoV-2 variants related to mink* on 12<sup>th</sup> November 2020<sup>41</sup> that recommendations were made to EU Member States with regard to testing regimes. The ECDC report will be discussed further below.

With respect to testing regimes, the COVID-19 crisis in the fur farming sector has also highlighted that countries and federal states do not necessarily know exactly how many fur farms there are within their borders.

For example, in mid-October 2020, the Danish Veterinary and Food Authority gave a figure of 1137 mink farms on their website, while a month later the number had increased to 1147.<sup>42</sup> Likewise, the Swedish authorities do not seem to know just how many fur farms there are still in existence there with the total varying between 34 and 40. It is also not known exactly how many fur farms there are in the US or their precise locations.

This raises serious concerns about the ability of the competent authorities to effectively implement a COVID-19 surveillance programme, let alone carry out animal welfare checks on mink farms throughout the production cycle and at the time of killing.

### Jumping back and forth across the species divide

It has become evident that SARS-CoV-2 is capable of jumping back and forth between humans and mink, and that the virus is able to mutate in mink prior to re-infecting people<sup>43</sup>. Farm workers infected with COVID-19 appear to be the initial source of infection in mink herds.

Mustelid species, such as mink, seem to be particularly susceptible to the virus. One of the features of SARS-CoV-2 is that it directly targets the cells of the respiratory systems of mink, just as with people.<sup>44</sup>

As a result, symptomatic, sick mink most likely will experience severe respiratory distress before dying. This also makes COVID-19 infection an animal welfare problem and, as noted above, the welfare of animals on fur farms is already poor and immune systems suppressed as a result of chronic stress.

### *Developments in the Netherlands*

Nearly three million mink have already been preventatively culled as a result of SARS-CoV-2 being detected on fur farms in the Netherlands.

As noted above, the Netherlands was the first country to confirm the outbreak of COVID-19 in mink. Fur farms are largely concentrated in one part of the country, primarily in the province of North Brabant and just across the neighbouring borders of Limburg and Gelderland. These areas are more generally characterised as having a high density of intensive animal production.<sup>45</sup>

There were still 128 mink farms registered in the Netherlands at the outset of the outbreak. Many of the operations affected by COVID-19 were large farms with between 4000-12,000 (or more) breeding females on site. With an average mink litter of approximately 5 kits, this means that over 60,000 mink were likely culled on some farms.

All mink on affected fur farms have been swiftly killed and a rapid warning system, requiring farms to regularly submit cadavers for testing, established to identify possible new cases. A ban on the transportation of live mink was also enacted to prevent further transmission. After more than forty cases had occurred, Parliamentary resolutions calling for an industry shutdown,<sup>46</sup> calls from regional safety boards<sup>47</sup> and steadily growing public health concerns, the Dutch government finally decided to effectuate the early closing of the mink sector, which was already being phased-out due to a ban that would have fully entered into force on 1<sup>st</sup> January 2024.<sup>48</sup> On 8<sup>th</sup> December 2020, the Agriculture Minister announced that the last mink on the remaining Dutch fur farms had been killed for their pelts bring the sector to a permanent end.<sup>49</sup>

One of the key reasons that precipitated this political decision to shut down the industry ahead of the original phase-out deadline were the findings of scientific research into the Dutch mink farm outbreaks. Using whole genome sequencing to investigate outbreaks on 16 fur farms, the researchers found that, after the detection of SARS-CoV-2 on mink farms, 66 of 97 (67%) persons (occupationally) associated with these farms tested were shown to be infected with SARS-CoV-2.<sup>50</sup>

Crucially, genetic analysis showed that the variant of SARS-CoV-2 virus was the same as those found in the mink, and were not identical to those found

in unrelated SARS-CoV-2 patients living in the vicinity of farms.<sup>51</sup>

The Outbreak Management Team-Zoonoses, which was responsible for monitoring the COVID-19 outbreak in the Netherlands and advising the government, deemed the continued existence of mink farms too great a risk.<sup>52</sup>

It has also been unclear just why the virus continued to spread rampantly among the Dutch mink herd after the mandatory implementation of strict biosecurity measures and the preventative culling of animals on infected farms from the outset of the outbreak.

Researchers exploring the modes of transmission between farms were uncertain whether SARS-CoV-2 continued to spread due to environmental factors, intermediate hosts (e.g. wild animals or escaped mink), the susceptibility of specific mink breeds, or human failings (e.g. not wearing the proscribed protective clothing, etc.).<sup>53</sup>

Indeed, it even led politicians to speculate whether the virus was being spread deliberately by fur farmers to get financial compensation.<sup>54</sup> The recent fall in pelt prices did indeed mean that producers may receive more for their culled mink than they would probably have done for the pelts at auction.

### *Developments in Denmark*

There are more than 1000 mink farms in Denmark, predominantly located in the north of the country. It is a small nation with a population of 5.83 million people, but which produces around 17 million mink pelts per annum.

COVID-19 was first detected on a Danish mink farm in North Jutland in June 2020.<sup>55</sup> The animals on this and the next two affected farms were preventatively culled, but the competent authorities decided to cease culling after the third farm and instead rely on strict biosecurity measures.<sup>56</sup>

This decision was later reversed when, by 1<sup>st</sup> October 2020, the disease had rapidly spread to dozens more farms bringing the total to 41. Two weeks later, the number of mink farm infections in Denmark had risen to 76 according the interactive map updated daily by the Danish Food and Veterinary Administration.<sup>57</sup> The continued spread of the virus indicates that biosecurity



measures were insufficient to prevent further transmission of the disease.

A cull of mink on around 100 of the 1147 Danish fur farms, primarily in the north of Denmark, was set in motion in early October with animals on farms within a 7.8km radius of COVID-19 positive ones also being killed.<sup>58</sup>

It was at this point that experts from the State Serum Institute noted that fur farmers had a greater risk of contracting COVID-19 than doctors and nurses.<sup>59</sup>

The numbers of Danish fur farms where SARS-CoV-2 had been detected continued to rise daily. On 21<sup>st</sup> October 2020, the Danish Food and Veterinary Administration stated that animals had to be killed on 250 farms, which corresponds to approximately every fifth farm and meant that about three million mink would be culled.<sup>60</sup>

Matters escalated a few weeks later when a new mink variant of the SARS-CoV-2 virus was detected. It was feared that this Covid-19 mutation moving from mink to humans could jeopardise future vaccines.

In short, the genetic mutations found – and dubbed Cluster 5 – alter the spike protein, enhancing the ability of the virus to bind to the ACE-2 receptors; the interaction between the virus spike protein and ACE-2 is an important first step for SARS-CoV-2 infection. The vaccines under development focus on making antibodies to block the interaction of these very spike-proteins.<sup>61</sup>

It became known that 12 people in northern Denmark had already been infected with this dangerously mutated virus. Half of 783 infected people in this region, where many fur farms are situated, had been found to have had infections stemming from the mink farms.<sup>62</sup>

In response to these findings, on 4th November 2020, the Danish government announced the radical step of culling all mink on the remaining fur farms and a temporary ban on mink production in the country.<sup>63</sup> With a population of up to 17 million farmed mink, this highlights the enormity of the problem and the need to take decisive action to eliminate the reservoir of SARS-CoV-2 and potentially dangerous mutations of the virus.

The Danish Food and Veterinary Administration ultimately detected SARS-CoV-2 in a total of 289

out of the 1147 mink farms in Denmark; this is around 25% of all the producers. These were all situated in the north of the country in municipalities close to North Jutland where the virus was first detected in mink.<sup>64</sup>

### *Developments elsewhere in Europe*

The enormity of the COVID-19 outbreaks on fur farms in both the Netherlands and Denmark have to some extent overshadowed the fact that this disease has also been found in mink elsewhere in Europe.

### *Spain*

On 16<sup>th</sup> July 2020, the Spanish authorities announced that a mink farm in Teruel, Aragon had been infected with SARS-CoV-2, and all 92,700 animals on the farm would be preventatively culled.<sup>65</sup> There had already been suspicions of possible infections in May after 7 farm workers had tested positive for COVID-19.<sup>66</sup>

### *Sweden*

Sweden reported its first case of COVID-19 in mink on 23<sup>rd</sup> October after increased mortality in animals on a fur farm located in Blekinge county. Mink producers were subsequently asked to send dead minks to Swedish Veterinary Institute for sampling and analysis, but no preventative cull of the infected herd was recommended.<sup>67</sup>

On 5<sup>th</sup> November, it was announced that an additional nine mink farms had been infected in the same area of Sweden where the initial case had been detected.<sup>68</sup> As of 1 December, a total of thirteen farms had been shown to be infected.<sup>69</sup>

### *Italy*

On 27<sup>th</sup> October 2020, it became publicly known that SARS-CoV-2 had been detected, with two positive samples, on a mink farm in Lombardy in August 2020. This fact was only revealed after the submission of an information request to the competent authorities.<sup>70</sup> The OIE was notified only on 30<sup>th</sup> October.

On 10<sup>th</sup> November the regional health councillor for Emilia-Romagna, where two mink farms can be found, announced that the region will back a ban in front of the Ministry of Health.<sup>71</sup>

On 11<sup>th</sup> November the Minister of Health notified the OIE the presence of a third positive sample from the same mink farm in Lombardy.

The Health Ministry issued an ordinance on 23<sup>rd</sup> November 2020 requiring the culling of animals on affected mink farms and the temporary cessation of breeding until February 2021.<sup>72</sup> Aside from forcing the fur farmer with an infected herd to kill his 26.000 animals (and affected farms in general), this legislative action was otherwise pointless given that the breeding season takes place in late February and March.

### **Greece**

On 11<sup>th</sup> November 2020, the Greek authorities announced that 10 workers and one farm owner had tested positive for COVID-19 in the municipality of Voio in Kastoria. Some dead animals were found on the farm, while others had symptoms.<sup>73</sup> Samples taken on the farm were found positive for SARS-CoV-2.<sup>74</sup>

By 13<sup>th</sup> November, the culling of all animals on the infected farm had been ordered and a 'no-go zone' of 10km surrounding it implemented. All fur farm workers in Greece were ordered to be tested, leading to 9 workers on 4 other farms also testing COVID-19 positive.<sup>75</sup>

### **France**

On 22<sup>nd</sup> November, mink were found to be infected with SARS-CoV-2 on one farm in Eure-et-Loire. Tests were ordered on the remaining three mink farms in France and all the animals on the affected farm were preventatively culled.<sup>76</sup>

### **Lithuania**

Lithuania also joined the litany of European countries affected by COVID-19 in mink on 26<sup>th</sup> November 2020 when the State Food and Veterinary Service reported infected mink and an infected worker on a fur farm in the Jonava district.<sup>77</sup>

### **Poland**

The Polish authorities only began testing mink farms for COVID-19 in November 2020 under vociferous protest from the mink farmers.<sup>78</sup>

To date, the tests taken by the State Veterinary authorities have come back negative. However, independent tests carried out on a sample of 91 mink by researchers at the Medical University of Gdansk yielded 8 positive results for SARS-CoV-2.<sup>79</sup>

### **Developments in North America**

COVID-19 in mink has not been confined to fur farms in Europe. On 17<sup>th</sup> August 2020, the US Department of Agriculture's Animal and Plant Health Inspection Service and National Veterinary Services Laboratories announced the first confirmed cases of SARS-CoV-2 in mink at two fur farms in Utah. The affected farms also reported positive cases of COVID-19 in people who were in contact with the mink occupationally.<sup>80</sup>

To date, SARS-CoV-2 has been found in mink on 16 fur farms in the US: 12 in Utah, 2 in Wisconsin<sup>81</sup>, 1 in Michigan<sup>82</sup> and 1 in Oregon.<sup>83, 84</sup>

No preventative culling has taken place on American mink farms; only biosecurity measures have been implemented.

Yet by early October 2020, it was reported that between 7000-8000 mink on US farms had already died from coronavirus. In Utah, the most badly affected US State, the State Veterinarian even downplayed the risk of the disease to human health. This is long after cases of direct transmission of COVID-19 from mink to humans had been confirmed in Europe.<sup>85</sup>

The first case of SARS-CoV-2 in Canada was confirmed by the National Centre for Foreign Animal Disease on a mink farm in British Columbia on 12<sup>th</sup> December 2020.<sup>86</sup>

## **ECDC risk analysis**

As noted above, the European Centre for Disease Prevention and Control's (ECDC) *Rapid Risk Assessment: Detection of new SARS-CoV-2 variants related to mink* was published on 12<sup>th</sup> November 2020.<sup>87</sup>

The ECDC Rapid Risk Assessment unsurprisingly concludes that the greatest risks posed by SARS-CoV-2 are to those working occupationally with

mink or living in the communities close to mink farms, particularly if individuals are already medically vulnerable.

However, the report clearly recognises that the evolution of the virus in mink has potential implications for COVID-19 diagnosis, treatment and vaccine development, particularly regarding the effectiveness of future vaccines in humans.

Their recommendations to Member States for dealing with SARS-CoV-2 infections in mink are not so different from what is already happening in some countries, such as the Netherlands, where systematic testing and monitoring of (dead) mink takes place with the culling of mink and destruction of carcasses and pelts on farms where SARS-CoV-2 has been detected.

It is, however, evident that the biosecurity measures taken by fur farmers, particularly in Denmark, have not been fully effective in stopping the transmission of COVID-19 to other mink farms,

nor from infecting people who have come into contact with infected mink or farm workers.

For those countries that have mink farms and were not yet doing any kind of systematic testing of either mink or mink farm workers, the ECDC risk analysis precipitated a programme of testing. In Poland, for example, the screening of mink for COVID-19 on a proportion of fur farms only began after its publication. Furthermore, as will be outlined below, it is unclear whether other fur-bearing species held on farms are also being tested for SARS-CoV-2.

## OIE response to COVID-19 in mink

On 12<sup>th</sup> November 2020, the World Organisation for Animal Health (OIE) issued a statement that acknowledged that susceptible animals, such as mink, could become a SARS-CoV-2 reservoir that may pose a continued public health risk and lead to future spillover events to humans.<sup>88</sup>

While noting that there are important public health implications, the OIE advises that further investigation is needed to fully understand the impact of mutations of SARS-CoV-2 in mink and recommend close collaboration between animal and public health authorities - using a One Health approach - to better identify and reduce the impact of this disease.

The OIE recommends that countries implement risk reduction strategies and monitor susceptible animals, such as mink and raccoon dogs, as well as humans in close contact with them, for SARS-CoV-2 infection.

All cases of SARS-CoV-2 should be reported to the OIE through the World Animal Health Information System and genetic sequences of the viruses isolated from animals and other research findings shared with the global health community.

Lastly, the OIE has developed guidelines for people working with susceptible farmed animals, as well as with wild mammals.<sup>89</sup>

## COVID-19 and other fur farmed species

To date, the focus of research, testing and political debate with regard to COVID-19 has primarily focused on mink farming. However, it is important to note that other species are also exploited for fur production, in particular foxes and raccoon dogs.

It is unclear what measures have been taken by the countries where the breeding of these species is still permitted to monitor and test both foxes and raccoon dogs for COVID-19. In Europe, these species are still exploited for fur production, primarily in Finland and Poland.

### *Raccoon dogs*

It is known that raccoon dogs are susceptible to coronaviruses and that this species may have been an intermediate host for the SARS-CoV virus.

Raccoon dogs sold on a wildlife market in Shenzhen, China were infected with SARS-CoV and the virus was found to be genetically almost identical to that found in palm civets, leading the scientists to suggest that both palm civets and raccoon dogs could be intermediate hosts for SARS-CoV.<sup>90</sup>

A more recent scientific paper has concluded that raccoon dogs are susceptible to and can efficiently transmit SARS-CoV2 and may serve as intermediate host for this virus too.<sup>91</sup>

When asked – in April 2020 - about what was known about the intermediate host for SARS-CoV-2 could be, leading German virologist Professor Christian Drosten noted that during the previous SARS epidemic this coronavirus had been “found in

civet cats, but also in raccoon dogs – something the media overlooked. Raccoon dogs are a massive industry in China, where they are bred on farms and caught in the wild for their fur. If somebody gave me a few hundred thousand bucks and free access to China to find the source of the virus, I would look in places where raccoon dogs are bred.”<sup>92</sup>

### **Foxes**

With respect to foxes, researchers in China found red foxes sold on a wildlife market in Guanzhou to

have been infected with a SARS-CoV-like virus.<sup>93</sup> Scientists predicted that red fox host cell binding sites were capable of binding to SARS-CoV-2, which causes COVID-19, and SARS-CoV, which causes SARS.<sup>94</sup>

### **Chinchillas**

No studies have been yet conducted with regard to the susceptibility of chinchilla for the virus, but it cannot be excluded that they pose a possible risk.<sup>95</sup>

## **Permanent closure of fur farms to protect public health and animal welfare**

It is evident that mink – and most likely also raccoon dog and fox<sup>96</sup> - farming creates a potential reservoir for SARS-CoV-2 and future strains of this coronavirus. Decisive action must be taken to mitigate this present risk and to preclude risks in the future.

In view of the disease risks – in addition to the clear inherent animal welfare problems (not to mention the environmental impact) - posed by fur farming, Humane Society International strongly advocates a permanent end to breeding, keeping and killing animals for the purposes of fur production.

Fur farming is a non-essential industry. It exists solely to supply the frivolous needs of the fashion trade and produces products for which there are countless warm, beautiful and humane alternatives, which do not require the caging and killing of animals.

### **Banning fur production**

Given widespread public opposition to the keeping and killing of animals for the production of fur on primarily ethical and animal welfare grounds, it can be posited that the permanent closure of fur farms would indeed receive a broad base of social support in most countries.

Indeed, fur farming has already been prohibited and/or is presently being phased out in nine Member States including Austria, Belgium, the Netherlands, Luxembourg, Slovenia, Czech Republic, Slovakia, United Kingdom and Croatia. Outside of the European Union, Norway, Serbia, the Republic of Macedonia and Bosnia and Herzegovina have also banned fur production.

Legislative proposals to ban fur farming are currently also under consideration, or have been

announced, in six EU Member States including Poland, Lithuania, France, Bulgaria, Estonia and Ireland.

It is notable that while Ireland has had no confirmed cases of COVID-19 on its 3 remaining fur farms, the Department of Health recommended that all 120,000 mink should be culled and the farmers prohibited from restocking.<sup>97</sup>

In addition to the aforementioned fur farming bans and industry phase-outs, Switzerland and Germany have adopted stricter regulations, which have effectively eliminated the breeding of all animals for fur. Sweden similarly eliminated fox and chinchilla production in this way. Denmark has also prohibited and is phasing out the breeding of foxes on animal welfare grounds.

On 25<sup>th</sup> November 2020, although none of the species are currently kept there, Hungary announced a ban on mink, fox, ferret<sup>98</sup> and coypu production as a precautionary measure due to animal welfare and COVID-19 concerns to prevent fur producers from elsewhere in Europe from moving their operations to the country.<sup>99</sup>

### **Public health reasons**

As illustrated by the discussion above, from a public health perspective, the continued presence of mink farms would serve to maintain reservoirs of SARS-CoV-2 within human communities.

Moreover, genetic mutations in the virus in mink, which have already been seen in Denmark, may affect our ability to halt the spread of and eliminate the disease and undermine the efficacy of any future vaccine. It is therefore necessary to eliminate this viral reservoir to avoid undermining efforts to control and eradicate COVID-19.

The outbreaks of COVID-19 on fur farms in Europe and the US raise critical issues about the risks posed by intensively keeping animals in close confinement for the purposes of fur production. The continued existence of fur farms, which solely exist for the production of luxury products for which there are many good and humane alternatives, also perpetuates a needless potential reservoir for future emerging infectious viral diseases.

There is no good societal – or moral - justification to allow fur farming to continue. Closure of the industry would only have a limited economic impact on a small group of individuals profiting from the practice of exploiting animals for their fur. The protection of human health – as well as animal welfare – outweighs the interests of a tiny minority who operate fur farms.

## Recommendations

As stated above, HSI unequivocally advocates the permanent closure of all fur farms to protect animal welfare, the environment and human health.

In all countries where fur farming is still permitted and/or is already being phased-out, it is necessary to take urgent and proportionate action to prevent the risk of maintaining reservoirs of SARS-CoV-2 and of jeopardising the effectiveness of the vaccines under development.

Given the devastating economic and social crisis caused by the global COVID-19 pandemic, the risk of a mutated virus compromising the effectiveness of vaccines for humans cannot be afforded. Certainly not for the sake of a minor and cruel industry that exists solely for the production of fashion products that no-one actually needs.

The next global pandemic could well find its origins or be spread through the needless practice of exploiting animals for the production of fur. The key question that policymakers, politicians and citizens of countries that continue to permit fur production should be asking is whether this is truly worth the risk to human health, our economy and social cohesion?

### *Protecting biodiversity*

It is also relevant to note that the continued existence of this disease reservoir also poses a risk to native wildlife. American mink is an invasive alien species. Fur farms have always been the key pathway of the introduction thereof and this species has long been implicated in the displacement of native mammals and biodiversity loss.<sup>100</sup>

If infection by SARS-CoV-2 spills into wild mustelids, these have the potential to become a permanent reservoir of infection for humans and other animal species. Such a scenario has been seen before with rabies in raccoons and skunks.<sup>101</sup> In some countries, this could also pose a risk to the European mink, which is a critically endangered species and extinct in most of its original range, partly due to competition with the invasive American mink.<sup>102</sup>

### *Emergency interim public health measures in lieu of fur production bans*

Notwithstanding developing and enacting legislative proposals to end fur farming at a national level, which HSI believes is the only way in which both human and animal health can be protected, in the interim HSI advises countries where fur farming is still legally permitted to take the following precautionary actions:

1. No breeding – or restocking of mink farms where animals have been culled – should take place;
2. All cross-border transportation of live mink and the transport of live mink between farms within national borders should be prohibited ;
3. The export and import of raw mink pelts should be prohibited;
4. Until all mink farms have ceased operating, countries that still permit fur farming should be required to implement a regular mandatory COVID-19 programme to diagnostically test (with mandatory genome sequencing) mink and other fur farmed species, such as raccoon dogs<sup>103</sup> and foxes, including the compulsory registration of all operations engaged in fur farming;

5. Countries may consider making proportionate financial support available to fur farmers *exclusively* to cover costs of dismantling of fur farming operations, professional retraining and assistance with transitioning to other (non-animal) activities;
6. Adopt preventive restrictions on the breeding, transport and live export/import of live raccoon dogs and foxes, plus raw furskins from these species, to also eliminate any potential risk of disease transmission from trade involving these species.

The actions outlined above are emergency measures only for the immediate protection of human health. HSI emphatically underlines our position that the only way to definitively protect both human health and animal welfare in the long term is to ensure that legislative action is taken to permanently end fur farming in the countries where it is still legally permitted.

The risk the continued existence of fur farms poses to society outweighs the limited economic benefits it delivers to the small minority engaged in the inhumane practice.

14<sup>th</sup> December 2020

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