



COVID-19 and animals: Information on risk mitigation measures for livestock and agricultural professionals

FAO has prepared this document at the request of Members in order to provide information for communications with livestock professionals (including farmers, producers, veterinarians, paraveterinarians, community animal health workers). It is recommended to use this information to provide practical guidance on how to prevent severe acute respiratory syndrome coronavirus 2, SARS-CoV-2 (the virus causing COVID-19), spreading between humans and animals in a farm setting, given that some animal species have shown to be susceptible to the virus.

The current spread of the COVID-19 pandemic is primarily due to human-to-human transmission. Infection of susceptible animal species with SARS-CoV-2 has occurred mostly after they were in contact with infected humans, with or without signs of disease. As such, infections in animals have generally been found through contact tracing following confirmation of COVID-19 human cases.

The information below regarding animal susceptibility to SARS-CoV-2 is based on the available evidence as of **8 January 2021**. Refer to the [World Organisation for Animal Health \(OIE\) for the latest information](#). It is important for livestock professionals to be made aware of this information, the recommended measures to protect humans and animals in farm settings, and the steps to take if infection is suspected. Specific recommendations are included in light of the SARS-CoV-2 variant strains recently developed in minks.

1. WHICH FARMED OR DOMESTIC ANIMAL SPECIES ARE SUSCEPTIBLE TO SARS-COV-2?

The following list summarizes our current knowledge with regards to susceptibility of farmed animals to SARS-CoV-2 as well as companion animals that are often found on farms.

Farmed animals

Highly susceptible:

- **Minks can be infected** with the virus. When infected, they may show clinical signs such as respiratory signs, gastrointestinal signs, increased mortality, but more frequently **infection may not cause any signs of disease at all**. Infected humans have introduced the virus into mink farms in several countries. Onward **mink-to-mink** as well as **mink-to-human** transmission have been seen on farms in Denmark and the Netherlands. There is evidence

from Denmark that SARS-CoV-2 has genetically evolved in mink into a new variant virus strain that was then reintroduced into humans.

- **Ferrets**, belonging to the same family as minks (*Mustelidae*), **can be infected** with the virus and can show signs of disease. In an experimental study, ferrets transmitted the disease to other ferrets through direct contact and through the air.
- **Raccoon dogs can be infected** with the virus but in an experimental study, they did not show disease signs or transmission to other racoon dogs with which they were in close contact.
- **Rabbits can be infected** with the virus but did not show disease signs in an experimental study. It has not yet been confirmed whether they can transmit the virus to other rabbits with which they are in close contact.

Low susceptibility:

- **Pigs showed low susceptibility** to the virus, very few number of pigs developed mild respiratory signs after inoculation with high virus infectious dose in laboratory settings.
- **Cattle showed low susceptibility** to the virus and did not show any signs of disease, nor did they transmit the virus to other cattle in an experimental study.

Not susceptible:

- **Chickens, turkeys, quail, geese, ducks and fish (both farmed and free) cannot be infected** with the virus.

Companion animals (often found on farms)

Susceptible:

- **Cats can be infected** with the virus and can develop respiratory and/or gastrointestinal signs. An experimental study has shown that infected cats can transmit the virus to other cats. Evidence to date suggests that cats become infected through contact with COVID-19 human cases, either in household settings or zoos (big cats). In addition, cats roaming on mink farms tested positive for SARS-CoV-2 in the Netherlands.
- **Dogs can be infected** with the virus, they **can show signs of disease** but have **not transmitted the disease** to other dogs they were in contact with in laboratory settings. The evidence to date indicates that dogs become infected through contact with humans with COVID-19.

2. HOW CAN I PROTECT MYSELF, OTHER PEOPLE ON THE FARM AND MY ANIMALS, FROM SARS-COV-2?

It is recommended that the following biosecurity measures are adopted to prevent introduction and transmission of SARS-CoV-2 between humans and highly susceptible animals.

The following measures should be followed when entering the farm:

- Workers and visitors should park their vehicles in designated areas away from animal housing.
- Non-essential visitors should not be allowed on the premises.
- A record should be kept of all people who enter the farm (the date, contact information, hour of entry and exit, the nature of their visit, and any visits to other farms in past two weeks); no person should be allowed onsite if their body temperature exceeds 37.5 C.

- Anyone who has [clinical signs compatible with COVID-19 \(see WHO\)](#), people who have tested positive for SARS-CoV-2 (including those who are asymptomatic or recovering), or people in isolation due to close contact with COVID-19 patients, or in mandatory quarantine, should not be allowed to enter the farm until their recovery has been confirmed by medical providers.
- For large farms, stagger arrival of workers entering the farm.
- Discourage the presence of dogs, cats, wild animals and pests by ensuring an integral fence, and blocking all holes and cracks with appropriate materials. Keep premises clean of feed and bedding. Ensure appropriate management of waste, faeces and other materials that may attract animals.
- Use an all-in all-out strategy, with cleaning and disinfection before restocking, using [recommended disinfectants \(see OIE\)](#) and following the instructions on the product label.
- Provide and wear appropriate Protective Personal Equipment (PPE) depending on the activity to be performed. Activities that entail a higher level of contact with animals will require increased PPE such as surgical masks, gloves, face masks and goggles.

The following measures should be adopted [when on the farm](#):

- Wear new or cleaned and disinfected PPE such as masks, aprons, gloves and boots when moving between each shed/barn.
- Use a footbath with clean disinfectant (changed daily) to disinfect boots when entering the farm.
- Change/disinfect PPE daily, i.e. every time before you enter and after you leave the farm.
- Clean and disinfect all spaces, using [recommended disinfectants \(see OIE\)](#) and following the instructions on the product label.
- Routinely clean and disinfect common areas for farm workers, e.g. resting areas, kitchen, coffee room, changing rooms, bathrooms and sleeping quarters.
- Clean the farm premises regularly using recommended cleaning and [disinfection products \(see OIE\)](#) watering systems that can be cleaned daily or weekly, if possible, or at least once a month.
- Ensure enclosures are well maintained to ensure animals cannot escape from or enter the farm.
- Avoid rotating workers among different farms, as doing so will increase the potential of virus spread.
- Ensure physical distance between people is observed at all times (at least 1 metre) and stagger mealtimes and breaks to avoid large gatherings in the break rooms.
- Prepare for a possible shortage of the workforce and prepare a contingency plan to ensure continuity of work.
- When using tools, make sure to always disinfect them after use and before use in any other part of the farm.
- Practice basic personal hygiene measures, in particular regular handwashing before and after handling animals.
- Raise awareness among farm workers about how SARS-CoV-2 spreads and how to avoid becoming infected, and routinely remind them about biosafety and biosecurity measures to protect against COVID-19 on the farm.

Monitoring and early warning: following national guidelines

- In countries with mink farms, it is recommended to implement an early warning and monitoring system. This could entail taking samples, including environmental samples, on a weekly basis on mink farms and sending mink carcasses for necropsies to the veterinary laboratory.
- Monitor your animals for clinical signs such as breathing problems, nasal discharge, gastrointestinal problems, and neonatal death. Keep regular records and monitor for significant changes (including deaths), and if any change is observed, report to your veterinarian, relevant veterinary authorities or available national hotline.
- Keep track on the number of living animals weekly to monitor the deaths and mortality rate accurately.

If you are displaying any symptoms of COVID-19 and need to quarantine or isolate, or have tested positive for the virus:

- Restrict contact with animals during your illness, just as you would with people.
- Make sure you have someone else take care of your animals when you need to be in quarantine or are not feeling well.
- As a matter of precaution, contact your veterinarian to find out if your animals should be tested.

3. WHAT SHOULD I DO IF MY ANIMALS COME IN CONTACT WITH SARS-COV-2?

No domestic animals should be abandoned, rejected or killed without providing justification from a country- or event-specific risk assessment addressing at least animal-to-human and animal-to-animal transmission.

In light of the recent SARS-CoV-2 variant strains that developed in minks, FAO recommends that any suspicion of farm animals to be infected with SAR-CoV-2 is brought to the attention of the relevant animal health authorities (see criteria below). FAO recommends testing animals that are susceptible to infection with SARS-CoV-2 (see list under section 1) if they have been in contact with infected animals or humans, or show clinical signs.

SARS-CoV-2 infection in captive, farmed, wild or domestic mink should be suspected if one or more of the following criteria are observed:

- Contact with or epidemiologically linked to a human with confirmed COVID-19 *regardless of the presence or absence of apparent clinical signs*.
- Contact with or epidemiologically linked to SARS-CoV-2 infected animal case *regardless of the presence or absence of apparent clinical signs*.
- Showing nasal discharge and/or respiratory distress (*regardless of the apparent prevalence in the herd*) with or without one or more of the following:
 - lack of appetite;
 - lethargy;
 - gastrointestinal signs;
 - adult mortality;
 - neonatal death.

Timeframe: The abovementioned criteria for suspecting SARS-CoV-2 infection in mink are applicable if observed during the investigation/visit or within 10 days prior.

Note: the abovementioned criteria are designed to be broad so that the level of detection of SARS-CoV-2 is improved in minks, given the importance of detecting cases early to monitor the fast mutation rate of SARS-CoV-2 in mink. For other susceptible animal species use the [case definition provided by OIE](#).

FAO RESOURCES ON LIVESTOCK AND COVID-19

- **FAO** [Guidelines to mitigate the impact of the COVID-19 pandemic on livestock production and animal health](#)
- **FAO** [Exposure of humans or animals to SARS-CoV-2 from wild, livestock, companion and aquatic animals](#)

ADDITIONAL RESOURCES

- **OIE** [Technical Factsheet on Infection with SARS-CoV-2 in Animals](#)
- **OIE** [Guidance on working with farmed animals of species susceptible to infection with SARS-CoV-2](#)
- **United States Department of Agriculture** [Response and containment guidelines: Interim Guidance for Animal Health and Public Health Officials Managing Farmed Mink and other Farmed Mustelids with SARS-CoV-2](#)
- **World Health Organization** [SARS-CoV-2 mink-associated variant strain- Denmark](#)
- **Centres for Disease Control** [Interim SARS-CoV-2 Guidance and Recommendations for Farmed Mink and Other Mustelids](#)
- **Centres for Disease Control** [COVID-19 and Animals](#)