Educational update on SARS-CoV-2 (COVID-19) Virus and Animals

January 3, 2021

Many members of the IACP have been interested and requesting information on SARS-Co-V 2 (COVID19) in animals to better equip them in educating their clients on this new virus and how it may have potential implications in their lives. Kristi Smith, a member of the Service Dog committee has been fielding most of these inquiries and the committee decided that a single source document which is kept up to date as new information on this virus emerges would be of benefit to the members of IACP and their clients would be beneficial. Below is the first such document. If you have any questions please don't hesitate to reach out to the Service Dog committee at sdcmte@canineprofessionals.com

As of December 23, 2020, the following information was compiled by numerous sources and is presented in a single reference document for individuals who work with animals, especially dogs in their business. Educational updates will be provided as information on SARS-CoV-2 (COVID-19) and how it relates to animals is learned.

SARS-CoV-2 is considered to be an emerging disease by the World Organization for Animal Health (OIE). USDA must report confirmed animal infections in the United States to the OIE. We are still learning about the SARS-CoV-2 virus, which causes COVID-19 in people, but it appears that it can spread from people to animals in some situations. A small number of animals worldwide have been reported to be infected with SARS-CoV-2, mostly after close contact with people with COVID-19. More information on COVID-19 can be found at:https://www.cdc.gov/coronavirus/2019-ncov/animals/pets-other-animals.html

The following updates are included in this document

1. Information from CDC on SARS-CoV-2 (COVID 19) and animals
2. Verified species of animals that have been exposed to the virus that causes COVID-19 in humans
3. Research on animals and COVID 19
4. Confirmed cases of SARS-Co-V-2 in animals in the United States
5. Current list of confirmed SARS-Co-V-2 cases in animals

CDC – SARS-CoV-2 (COVID-19) and Animals

What you need to know

- While it is not known the exact source of the current outbreak of coronavirus disease 2019 SARS-CoV-2 otherwise known as COVID-19, it is known that it originally came from an animal, likely a bat.
- At this time, there is still no evidence that animals play a significant role in spreading the virus that causes (COVID-19).
- Based on the limited information available to date, the risk of animals spreading COVID-19 to people is considered to be extremely low.
- More studies are needed to understand if and how different animals could be affected by COVID-19.
- We are still learning about this virus, but it appears that it can spread from people to animals in some situations.

For more information, click on the following two (2) *links*: Pets & SARS-CoV-2 Virus and If You Have Pets.

Coronaviruses are a large family of viruses. Some coronaviruses cause cold-like illnesses in people, while others cause illness in certain types of animals, such as cattle, camels, and bats. Some coronaviruses, such as canine and feline coronaviruses, infect only animals and do not infect humans.

Some coronaviruses that infect animals can be spread to humans and then spread between people, but this is rare. This is what happened with the virus that caused the current outbreak of COVID-19, with the virus likely originating in bats. The first reported infections were linked to a live animal market, but the virus is now spreading from person to person.

The virus that causes COVID-19 spreads mainly from person to person through respiratory droplets from coughing, sneezing, and talking. Recent studies show that people who are infected but do not have symptoms likely also play a role in the spread of COVID-19. At this time, there is no evidence that animals play a significant role in spreading the virus that causes COVID-19. Based on the limited information available to date, the risk of animals spreading COVID-19 to people is considered to be low. More studies are needed to understand if and how different animals could be affected by COVID-19.

The first US case of an animal testing positive for COVID-19 was a tiger at a NY zoo. We are still learning about this virus, but it appears that it can spread from people to animals in some situations, especially after close contact with a person sick with COVID-19.

Verified species of animals that have been infected with the virus that causes COVID-19

We know that cats, dogs, and a few other types of animals can be infected with SARS-CoV-2, the virus that causes COVID-19, but we don't yet know all of the animals that can get infected. There have been reports of animals being infected with the virus worldwide.

- A small number of pet cats and dogs have been reported to be infected with the virus in several countries, including the United States. Most of these pets became sick after contact with people with COVID-19.

- Several lions and tigers (*link*) at a New York zoo tested positive for SARS-CoV-2 after showing signs of respiratory illness. A puma in South Africa and Tigers in a Tennessee Zoo *(link*). Public health officials believe these large cats became sick after being exposed to zoo employees who were infected with SARS-CoV-2. **All of these large cats have fully recovered**.

- SARS-CoV-2 has been reported in mink (which are closely related to ferrets) and other mustelids, some that appear healthy on multiple farms in the Netherlands, Denmark, Spain, and the United States (*link*).
    - SARS-CoV-2 infection in farmed mink has been characterized by respiratory disease and an increased mortality rate.
    - Because some workers on these farms had symptoms of COVID-19, it is likely that infected farm workers were the source of the mink infections. There is concern that once the virus is introduced on a farm, spread can occur between Mink as well as from mink to other animals on the farm, including dogs and cats. Some farm cats and dogs on mink farms in Europe also tested positive for SARS-CoV-2, suggesting they had been exposed to the virus.
    - Currently, there is no evidence that animals play a significant role in the spread of SARS-CoV-2 to people. However, reports from infected mink farms in the Netherlands suggest that in these environments there is the possibility for spread of SARS-CoV-2 from mink to humans.

- Worker safety is critical to protect people and animals on mink farms. Mink farm workers with suspected or confirmed COVID-19 should avoid contact with animals, including mink, and should

follow available guidance for farmed mink and other mustelids to avoid introducing SARS-CoV-2 to mink on farms.

- Guidance developed collaboratively by the U.S. Department of Agriculture (USDA), CDC, and state animal and public health partners using a One Health approach is available to protect worker and animal health:
    - Prevent Introduction of SARS-CoV-2 on Mink Farms::Interim SARS-CoV-2 Guidance and Recommendations for Farmed Mink and Other Mustelids (*link*) Response and Containment Guidelines, Interim Guidance for Animal Health and Public Health Officials Managing Farmed Mink and other Farmed Mustelids with SARS-CoV-2 (*link*)

- CDC deployed One Health teams to multiple states to support state and local departments of health and agriculture, federal partners, and others in conducting on-farm investigations into people and multiple animal species with SARS-CoV-2 infection. As part of these investigations, the teams collected samples from animals on the farms and from people working on mink farms and in surrounding communities. CDC and USDA are collaborating to test and analyze these samples to better understand how SARS-CoV-2 can spread among mink, other animals, and people, as well as genetic variations of the virus. These investigations are ongoing and more information will be shared as it becomes available.
- CDC is aware of reports of a new strain of SARS-CoV-2 virus in mink in Denmark that is also present in the local human population. Based on reports from Denmark, it appears that mink became infected after exposure to people infected with the virus, and the virus then mutated and spread from mink back to humans. This new strain, called "Cluster 5," has not been seen before and is made up of five mutations.
    - Of mink and human samples tested so far in the United States, none have contained all the mutations that make up the Cluster 5 strain.
    - Currently in the United States, there is no evidence of SARS-CoV-2 spreading from mink to people, but investigations are ongoing. More information will be shared when it becomes available.

WHO, CDC, USDA, and state public health and animal health officials are working in some states to conduct active surveillance of SARS-CoV-2 in pets, including cats, dogs, and other small mammals, that had contact with a person with COVID-19 These animals are being tested for SARS-CoV-2 infection and also tested to see whether the pet develops antibodies to this virus. This work is being done to help us better understand how common SARS-CoV-2 infection might be in pets as well as the possible role of pets in the spread of this virus.

The U.S. Department of Agriculture (USDA) maintains a list *(link)* of all animals with confirmed infections with SARS-CoV-2 in the United States.

Research on animals and COVID-19

Many studies have been done and are currently ongoing to learn more about how this virus can affect different animals.

Research on SARS-Cov-2 in animals is limited, but studies are currently underway to learn more about how this virus can affect different animals.

- Recent experimental research shows that cats, dogs, ferrets, fruit bats, hamsters, and tree shrews can become infected with the virus. Cats, ferrets, fruit bats, and hamsters can also spread the infection to other animals of the same species in laboratory settings.

- Data from studies suggest that dogs can get infected but might not spread the virus to other dogs as easily as cats and ferrets can spread the virus to other animals of the same species.
- A number of studies have investigated non-human primates as models for human infection. Rhesus macaques, cynomolgus macaques, Grivets, and common marmosets can become infected SARS-CoV-2 and become sick in a laboratory setting.
- Mice, pigs, chickens, and ducks do not seem to become infected or spread the infection based on results from these studies.

These findings were based on a small number of animals, and do not show whether animals can spread infection to people. More studies are needed to understand if and how different animals could be affected by COVID-19.

CDC, USDA, state public health and animal health officials, and academic partners are working in some states to conduct active surveillance of SARS-CoV-2 in pets, including cats, dogs, and other small mammals that had contact with a person with COVID-19. These animals are being tested for SARS-CoV-2 infection and also tested to see whether the pet develops antibodies to this virus. This work is being done to help us better understand how common SARS-CoV-2 infection might be in pets as well as the possible role of pets in the spread of this virus.

Confirmed cases of SARS-CoV-2 in Animals in the United States

As of December 23, 2020, at least 38 dogs and 54 cats in the U.S. have been confirmed to be infected with the SARS-CoV-2 virus. According to the Journal of the American Veterinary Medical Association (JAVMA), pets in Alabama, Arizona, California, Florida, Georgia, Illinois, Kansas, Kentucky, Louisiana, Maryland, Minnesota, New York, North Carolina, Pennsylvania, South Carolina, Texas, Utah, and Wisconsin have been confirmed as infected with the SARS-CoV-2 virus with each of the animals exposed to people with known or likely infections, according to the U.S. Department of Agriculture.

The World Organization for Animal Health, APHIS officials have released some case information on several of the early cases of animals testing positive for the SARS-CoV-2 Virus.

1. APHIS Officials said a dog in Arizona tested positive after showing signs of respiratory disease, but recovered. It is unknown if the respiratory disease was a result of the SARS-CoV-2 virus.
2. In an article by Greg Cima published in JAVMA on August 12, a veterinarian in California saw an 11-year-old male cat in late June for signs of respiratory difficulty and found the cat had hypertrophic cardiomyopathy. It died the following day, according to California Department of Health officials. A second cat lived in the same home without clinical signs of illness.
3. The Texas Animal Health Commission reported a veterinarian having requested testing of a 2-year-old dog for SARS-CoV-2 as a precaution because its owners had confirmed infections. The dog tested positive but was healthy as of July 8.
4. Additional reporting by Mr. Cima states that the Georgia Department of Public Health found SARS-CoV-2 infection in a 6-year-old dog after it developed neurologic illness. It was euthanized days later, but it was diagnosed with a progressive neurological illness from another condition. A second dog from the same home lacked signs of illness, and health authorities were waiting for results of testing on that dog. The report also says that, in July, health authorities reported finding virus-neutralizing antibodies in four cats and two dogs in Utah, two dogs in Wisconsin, and one dog in North Carolina. Mr. Cima goes on to say that APHIS officials have been tracking infections in animals, starting with April's infections among ill tigers and lions at the Bronx Zoo in New York City. The other infected animals were two cats and four dogs in New York state and one cat each in Illinois and Minnesota. He also reported that according to Dr. Ryan M. Wallace, veterinary epidemiologist for the Centers for Disease Control and Prevention and member of the agency's One Health Working Group, the CDC helped state agencies

investigate reports this summer of SARS-CoV-2–infected pets with severe illness, and all of those animals had severe underlying conditions. The dog in Georgia with neurologic abnormalities, for example, had a brain tumor found during necropsy. SARS-CoV-2 infections were not identified as the cause of death for those animals, although it's difficult to determine whether the virus could have contributed to their illnesses. Mr. Cima's article cites Dr. Wallace as saying that studies of experimental infections in dogs and cats so far have involved small sample sizes, typically comprised of young and healthy animals, but that the infections in those studies tended to result in few clinical signs of illness. Dr. Wallace stated that most pets with confirmed infections also have required little veterinarian intervention.

The table below lists cases of SAR-CoV-2 (the virus that causes COVID-19 in humans) in animals that have been confirmed by USDA's National Veterinary Services Laboratories. Only the first animal of a species at a single facility, home or location will be reported in the table. Confirmed cases of SARS-CoV-2 in Animals in the United States

List of SARS-CoV-2 Cases (1/4)

Most recently identified case locations are listed first. Unless otherwise specified, the animal(s) had exposure to a probable or confirmed human with COVID-19.
*PCR: real-time reverse transcription polymerase chain reaction; Ab: virus neutralizing antibody
Footnote 1: Samples collected as part of planned and targeted active surveillance of a specific animal, with known or suspected exposures to a person with COVID-19 or other exposure to SARS-CoV-2, to better understand risk factors for SARS-CoV-2 transmission.
Footnote 2: The COVID-19 status of human(s) associated with the case is unknown and/or under investigation

Location ID	Date Confirmed	Location Type - Animal	State	Method of Initial Diagnosis*	Status
85	12/21/2020	household - Dog	Arizona	Ab	Confirmed
84	12/21/2020	household - Dog	Pennsylvania	PCR	Confirmed
83	12/11/2020	household - Dog	Kansas	PCR	Confirmed
82	12/10/2020	conservatory - Snow Leopard..	Kentucky	PCR	Confirmed
81	12/7/2020	household - Dog	Pennsylvania	PCR	Confirmed
80	12/7/2020	household - Cat	Texas	PCR	Confirmed
79	12/7/2020	household - Cat	Wisconsin	PCR	Confirmed
78	12/7/2020	household - Dog	Florida	PCR	Confirmed
77	11/16/2020	household - Cat a	Texas	PCR	Confirmed
		household - Cat b	Texas	PCR	Confirmed
76	11/16/2020	household - Cat	Texas	PCR	Confirmed
75	11/27/2020	premises - Mink	Oregon	PCR	Confirmed
74	11/5/2020	premises - Mink	Utah	PCR	Confirmed
73	11/5/2020	premises - Mink	Utah	PCR	Confirmed
72	11/5/2020	premises - Mink	Utah	PCR	Confirmed
71	10/30/2020	premises - Mink	Wisconsin	PCR	Confirmed
70	10/30/2020	conservatory - Tiger a	Tennessee	PCR	Confirmed
		conservatory - Tiger b	Tennessee	PCR	Confirmed
	11/6/2020	conservatory - Tiger c	Tennessee	PCR	Confirmed
69	10/21/2020	household - Cat a	Texas	Ab	Confirmed
		household - Dog b	Texas	Ab	Confirmed
68	10/21/2020	household - Cat	Texas	Ab	Confirmed
67	10/21/2020	household - Dog a	Texas	Ab	Confirmed
		household - Dog b	Texas	Ab	Confirmed
		household - Dog c	Texas	Ab	Confirmed
66	10/21/2020	household - Dog	Texas	PCR	Confirmed
65	10/16/2020	household - Cat	Pennsylvania	PCR	Confirmed
64	9/28/2020	household - Cat a	Texas	Ab	Confirmed
		household - Cat b	Texas	Ab	Confirmed
63	9/28/2020	household - Cat	Texas	Ab	Confirmed
62	10/7/2020	premises - Mink	Michigan	PCR	Confirmed
61	10/7/2020	premises - Mink	Wisconsin	PCR	Confirmed
60	10/7/2020	premises - Mink	Utah	PCR	Confirmed
59	10/6/2020	household - Cat a	Alabama	PCR	Confirmed
	11/12/2020	household - Cat b	Alabama	PCR	Confirmed

List of SARS-CoV-2 Cases (2/4)

Most recently identified case locations are listed first. Unless otherwise specified, the animal(s) had exposure to a probable or confirmed human with COVID-19.
*PCR: real-time reverse transcription polymerase chain reaction; Ab: virus neutralizing antibody
Footnote 1: Samples collected as part of planned and targeted active surveillance of a specific animal, with known or suspected exposures to a person with COVID-19 or other exposure to SARS-CoV-2, to better understand risk factors for SARS-CoV-2 transmission.
Footnote 2: The COVID-19 status of human(s) associated with the case is unknown and/or under investigation

Location ID	Date Confirmed	Location Type - Animal	State	Method of Initial Diagnosis*	Status
59	11/12/2020	household - Cat c	Alabama	Ab	Confirmed
		household - Cat d	Alabama	Ab	Confirmed
58	9/30/2020	household - Dog	Texas	PCR	Confirmed
57	9/30/2020	household - Cat	Texas	PCR	Confirmed
56	9/24/2020	premises - Mink	Utah	PCR	Confirmed
55	9/24/2020	premises - Mink	Utah	PCR	Confirmed
54	9/24/2020	household - Cat	New York	Ab	Confirmed
53	9/24/2020	household - Cat	New York	Ab	Confirmed
52	9/24/2020	household - Cat	New York	Ab	Confirmed
51	9/17/2020	premises - Mink	Utah	PCR	Confirmed
50	9/17/2020	household - Cat	Kentucky	PCR	Confirmed
49	9/2/2020	household - Dog	Texas	PCR	Confirmed
48	9/2/2020	household - Cat	Texas	PCR	Confirmed
47	9/2/2020	household - Cat	Texas	PCR	Confirmed
46	9/2/2020	household - Cat a	Texas	PCR	Confirmed
	9/24/2020	household - Cat b	Texas	Ab	Confirmed
		household - Cat c	Texas	Ab	Confirmed
		household - Cat d	Texas	Ab	Confirmed
		household - Cat e	Texas	Ab	Confirmed
45	9/2/2020	household - Dog	Texas	PCR	Confirmed
44	8/27/2020	household - Cat a	Louisiana	PCR	Confirmed
	9/22/2020	household - Cat b	Louisiana	Ab	Confirmed
		household - Cat c	Louisiana	Ab	Confirmed
43	8/25/2020	household - Dog	Texas	Ab	Confirmed
42	8/25/2020	household - Dog	Texas	Ab	Confirmed
41	8/25/2020	household - Cat	Texas	Ab	Confirmed
40	8/25/2020	household - Dog	Texas	Ab	Confirmed
39	8/25/2020	household - Dog	Texas	Ab	Confirmed
38	8/25/2020	household - Cat a	Texas	Ab	Confirmed
		household - Cat b	Texas	Ab	Confirmed
37	8/25/2020	household - Dog	Texas	Ab	Confirmed
36	8/25/2020	shelter - Cat	Arizona	Ab	Confirmed
35	8/25/2020	household - Cat a	Maryland	PCR	Confirmed
	8/26/2020	household - Cat b	Maryland	Ab	Confirmed
		household - Dog c	Maryland	Ab	Confirmed

List of SARS-CoV-2 Cases (3/4)

Most recently identified case locations are listed first. Unless otherwise specified, the animal(s) had exposure to a probable or confirmed human with COVID-19.

*PCR: real-time reverse transcription polymerase chain reaction; Ab: virus neutralizing antibody

Footnote 1: Samples collected as part of planned and targeted active surveillance of a specific animal, with known or suspected exposures to a person with COVID-19 or other exposure to SARS-CoV-2, to better understand risk factors for SARS-CoV-2 transmission.

Footnote 2: The COVID-19 status of human(s) associated with the case is unknown and/or under investigation

Location ID	Date Confirmed	Location Type - Animal	State	Method of Initial Diagnosis*	Status
34	8/25/2020	premises - Mink	Utah	PCR	Confirmed
33	8/24/2020	household - Cat	California	PCR	Confirmed
32	8/19/2020	premises - Mink	Utah	PCR	Confirmed
31	8/19/2020	premises - Mink	Utah	PCR	Confirmed
30	8/17/2020	premises - Mink	Utah	PCR	Confirmed
29	8/17/2020	premises - Mink	Utah	PCR	Confirmed
28	8/12/2020	household - Cat	Georgia	PCR	Confirmed
27	8/12/2020	shelter - Cat a	New York	Ab	Confirmed
		shelter - Cat b	New York	Ab	Confirmed
26	8/11/2020	household - Dog	Texas	PCR	Confirmed
25	8/11/2020	household - Cat a	Texas	PCR	Confirmed
	8/25/2020	household - Cat b	Texas	Ab	Confirmed
		household - Cat c	Texas	Ab	Confirmed
24	8/11/2020	household - Dog	North Carolina	PCR	Confirmed
23	8/3/2020	household - Dog	Louisiana	PCR	Confirmed
22	7/22/2020	shelter - Dog	North Carolina	Ab	Confirmed
21	7/22/2020	household - Dog	Wisconsin	Ab	Confirmed
20	7/22/2020	household - Dog	Wisconsin	Ab	Confirmed
19	7/22/2020	household - Dog	Utah	Ab	Confirmed
18	7/22/2020	household - Cat	Utah	Ab	Confirmed
17	7/22/2020	household - Cat	Utah	Ab	Confirmed
16	7/22/2020	household - Cat a	Utah	Ab	Confirmed
		household - Cat b	Utah	Ab	Confirmed
	9/2/2020	household - Dog c	Utah	Ab	Confirmed
15	7/22/2020	household - Cat a	Texas	PCR	Confirmed
	9/2/2020	household - Dog b	Texas	Ab	Confirmed
		household - Dog c	Texas	Ab	Confirmed
14	7/21/2020	household - Cat a	Texas	PCR	Confirmed
	9/2/2020	household - Dog b	Texas	Ab	Confirmed
		household - Dog c	Texas	Ab	Confirmed
13	7/15/2020	household - Dog	Arizona	PCR	Confirmed
12	7/9/2020	household - Dog	South Carolina	PCR	Confirmed
11	7/8/2020	household - Cat	California	PCR	Confirmed
10	7/8/2020	household - Dog	Texas	PCR	Confirmed
9	7/1/2020	household - Dog a	Georgia	PCR	Confirmed

List of SARS-CoV-2 Cases (4/4)

Location ID	Date Confirmed	Location Type - Animal	State	Method of Initial Diagnosis*	Status
9	8/17/2020	household - Dog b	Georgia	Ab	Confirmed
8	6/24/2020	household - Dog	New York	Ab	Confirmed
7	6/24/2020	household - Dog	New York	Ab	Confirmed
6	6/4/2020	household - Cat	Illinois	PCR	Confirmed
5	6/1/2020	household - Cat	Minnesota	PCR	Confirmed
4	6/1/2020	household - Dog a	New York	PCR	Confirmed
	6/25/2020	household - Dog b	New York	Ab	Confirmed
3	4/22/2020	household - Cat	New York	PCR	Confirmed
2	4/22/2020	household - Cat	New York	PCR	Confirmed
1b	4/15/2020	conservatory - Lion a	New York	PCR	Confirmed
		conservatory - Lion b	New York	PCR	Confirmed
		conservatory - Lion c	New York	PCR	Confirmed
1a	4/4/2020	conservatory - Tiger a	New York	PCR	Confirmed
	4/15/2020	conservatory - Tiger b	New York	PCR	Confirmed
		conservatory - Tiger c	New York	PCR	Confirmed
		conservatory - Tiger d	New York	PCR	Confirmed

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