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COVID-19 and Livestock: The Present and Future

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On December 12th 2019, the causative agent (corona virus) was identified as a member of *Coronaviridae* family. COVID-19 is a large single stranded RNA virus of about 30,000 base pairs belonging to *Coronaviridae* family. Later, on January 12th 2020 this fast-spreading virus was designated as “2019-novel coronavirus (2019-nCoV)” and on February 11th 2020 Novel Coronaviral Pneumonia and CoV-associated diseases were referred to as “COVID-19” by World Health Organization (WHO). Subsequently, Coronavirus Study Group (CSG) of the International Committee on Taxonomy of Viruses (ICTV) designated this emerging virus was as “SARS-CoV-2”. Finally, on March 11, 2020 the WHO declared the situation as a pandemic threatening mankind’s ex-

istence. The virus was first reported from Wuhan, China affecting more than 200 countries throughout the world. Its genome has 77.5 % resemblance to the SARS but 96 % resemblance to one of strain found in bats. It is a large family of viruses, ranging from common cold to Middle East Respiratory Syndrome (MERS) etc. Approximately 20 % of colds are the result of a human coronavirus. Animal species (dog, cat, pig, and cattle) have their own coronaviruses that cause a variety of illnesses but do not cause any affect humans. Some coronaviruses, such as canine and feline coronaviruses, infect only animals and do not infect humans.

SARS-CoV-2, the virus responsible for COVID-19, originated from wild animals in China and is highly mutagenic, contagious in nature,

having ability to infect and spread efficiently among humans. Some coronaviruses cause cold-like symptoms in people, while others cause illness in animals such as cattle, camels, and bats. A few animals that are living with COVID-19 patients like dogs and cats have tested positive for the presence of virus. The COVID-19 outbreak once again proves the potential of the animal-human interface as the primary source of emerging zoonotic diseases. However, at this time there is no substantial evidence that animals play a significant role in spreading the virus that causes COVID-19 therefore the risk of animals spreading COVID-19 to people is considerably low. This virus has 4 genus: alpha, beta, gamma and delta coronavirus and various human affections are caused by alpha & beta strains like severe acute respiratory syndrome (SARS), middle-east respiratory syndrome (MERS) & COVID-19. Pigs are primarily affected by alpha and delta strains; poultry by gamma strains of coronavirus whereas bovines are affected by beta strains. Bats are reservoir of alpha & beta virus whereas birds act as reservoir of gamma & delta coronavirus.

Animal's role in COVID-19 and some considerations

- The exact source of the current outbreak of COVID-19 is not known, but we know that it originally came from an animal, most likely a bat
- There is no concrete evidence that animals play a significant role in spreading the virus that causes COVID-19 and the risk of animals spreading COVID-19 to people is considered to be low
- COVID-19 positive cases have been recently reported in cats, dogs, lion and tigers which might be due to reverse transmission by corona positive human being
- Cats, lion & tiger are more prone to covid-19 (SARS COV-2) affections than dogs, but no cases in bovine & pigs have been reported till date.
- Livestock are not directly associated with present COVID-19
- More studies still have to be conducted to understand if and how different animals could be infected by COVID-19 and how it can be transmitted from humans.

Impact of COVID-19 on animal

husbandry

The animal husbandry industry has been adversely impacted by the effect of coronavirus, globally. There has been a sharp fall in the demand for chicken and meat since the outbreak as there have been rumors amongst the peoples that the virus can spread through the animal's meat and chicken. However, many global agencies as well as the Centers for Disease Control & Prevention declared that coronavirus is known to be only transmitted via direct contacts to humans, and not via livestock or aquatic animals species or their meat. The primary factors that were responsible for the sector growth before the pandemic were changing lifestyles and increased consumption of meat, beef, chicken and other kinds of seafood such as prawns globally. Animal husbandry industry is segmented by type into dairy, meat, poultry, aquaculture, and others (insects). Meat and poultry sector are already experiencing severe decline due to the COVID-19 pandemic. Based on the regional viewpoint, the most affected regions are the US, China, Italy, France, Germany, Spain, UK, and India. The regional demand for chicken and

meat is decreased due to the increased rate of virus spread. Further, it has also been witnessed that the peoples are opting for the jackfruit as the replacement of chicken and mutton in India. Also, during lockdowns the shutdowns of the food chain services including restaurants has affected the market growth negatively.

Countries are announcing several relief packages in order to reduce the impact of coronavirus in the sector as well as the rumors with it. For instance, in India, the government has set up the COVID-19 Economic Response Task Force to assess the impact of COVID-19 in the various sectors including animal husbandry. A Chicken Fair in Uttar Pradesh state was recently organized by the Poultry Farm Association of India to dispel the rumors that COVID-19 spreads by consumption of chicken. Animal products like meat, milk & eggs are free from the corona virus however proper care, hygiene and social distancing norms should be followed while purchasing and selling of any food items.

Conclusion and future perspective

Till date there is no known effective treatment for COVID-19 and

main focus is to stop human-to-human spread which is an effective prevention and control strategy. Taking the rapid spread of COVID-19 across the globe, the latest updates about SARS-CoV-2 with special emphasis on the role of pets and other animals on disease transmission, which will have implications for prevention and control of the disease. Animals could play an important role in SARS-CoV-2 disease transmission and to prevent animal-to-animal spread in animals that belong to owners infected with SARS-CoV-2, they should be kept indoors in line with similar lockdown recommendations for humans. Along with other successful management of the pandemic, it is very critical to conduct further studies on the overall zoonotic risks of SARS-CoV-2 and on the possible intermediate host to prevent the re-emergence of the virus. Furthermore, it is recommend, to enhance the strategy for animal epidemic prevention and control. One-health approach should be followed by implementing a global prevention and control strategy for zoonotic diseases, to protect humans, animals and economies alike.









