Republic of Iraq
Ministry of Higher Education
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University of Al-Qadisiyah
College of Veterinary Medicine

Bovine coronavirus

A study

Submitted to the Department Council of the Internal and Preventive Medicine-College of Veterinary Medicine, University of Al-Qadisiyah in Partial Fulfillment of the Requirements for the Degree of Bachelor in Veterinary Medicine & Surgery

By

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بسم الله الرحمن الرحيم

فَتَعَالَى اللَّهُ الْمَلِكُ الْحَقُّ

وَلَا تَعْجَلْ بِالْقُرْآنِ مِن قَبْلِ أَن يُقْضَى إِلَيْكَ وَحْيُهُ

وَقُل رَّبِّ زِدْنِي عِلْماً

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Certificate of Supervisor

I certify that this study , entitled **((Bovine coronavirus))**, was prepared under my supervision at College of Veterinary medicine/University of Al-Qadisiyah in Partial Fulfillment of the Requirements for Bachelor's degree in Veterinary Medicine and Surgery .

Assist. Prof. Dr. Muthanna H. Hussain

Supervisor

Certificate of Department

We certify that **Raghad Muthanna Jamil** has completed the fulfillment of her graduation project entitled **Bovine coronavirus** for the year 2020/2021 under our construction.

Instructor

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-- / -- / 2021

Committee Certification

We, the examining committee, certify that we read this study entitled (Bovine coronavirus) and have examined the student(Raghad Muthanna Jamil) in its contents, and that in our opinion it is adequate as a study for Bachelor's degree in Veterinary Medicine and Surgery.

Approved by the Council of College of Veterinary Medicine.

Prof.

Dean

Dedication

To my right hand, the straightness of my back, the joy of my days and my first girlfriend

To those who were supportive of me in my worst days and did not spare me a day with her love and giving (my mother)

To our only hero and whoever spreads gray hair in his head, to illuminate the darkness of our days and facilitate the way of life for us who have struggled and given and amazed his gift, my father.

contents

Summary

Bovine coronavirus is widespread in the cattle breeding and is lead to highly economic losses. Clinical signs which occurs virus infection are diarrhea in calf, complicated pneumonia in calves and cows, combined pneumonia and winter dysentery in young and cows .

The genetics information about of the virus is still limited and the enter virus have not been completely differentiated, lack of cloistral immunity in calves is an important risk factor to predispose of most infectious diseases such as diarrhea and respiratory tract infection by this virus .

Bovine coronavirus infection cattle breeding industry warrants timed , vaccination with specific antigens to prevent this infection in susceptible animals, modern strategies to prevent viral infection in calves consist in vaccinating the cows in late pregnant period provide passive immunity .

1_Introduction

Coronaviruses classified under enveloped viruses all of these viruses has largest RNA genome average between 26.4–31.7 kb that belong to the family Coronaviridae, coronaviruses are contain four genera (Alphacoronavirus, Betacoronavirus, Gammacoronavirus, and Deltacoronavirus) with alpha- and betacoronaviruses infected mammalian , while other two genera infected avian. Bovine coronavirus is a cause pneumonia which under the species Betacoronavirus (Anders , 1996 & Bendali, et al.,1999) .

In porcine cause hemagglutinating encephalomyelitis , equine coronavirus , HCoV-OC43, HECoV-44, and canine respiratory complications of coronavirus Bovine coronaviruses essentially in cattle cause respiratory and enteric diseases and other ruminants isolated the virus from the respiratory system and intestinal tracts for healthy cattle (Aiumlamai ,et al., 1992; Anders , 1996 , Baba et al., 1994 & Battaglia et al., 1986).

Virus is shed in nasal secretions and feces virus infection are associated with three clinical syndromes in cattle, diarrhea in neonatal calf called winter dysentery pathognomonic clinical signs is hemorrhagic diarrhea and in cattle cause respiratory infections in different stages of age called shipping fever of healthy feedlot cattle . virus causes high ratio of morbidity and mortality lead to major economic losses to the beef and dairy cattle breeding (Anders , 1996; Bendali, et al.,1999, Broes ,1984 & Bürki,1985).

2_ literature review

2-1 Etiology

Virus classification

Unranked	:Virus
Realm	:Ribavirin
Kingdom	:Orthornavirae
Phylum	:Pisuviricota
Class	:Pisoniviricetes
Order	:Nidovirales
Family	:Coronaviridae
Genus	:Beta coronavirus
Species	:Beta coronavirus 1
Virus	:Bovine coronavirus

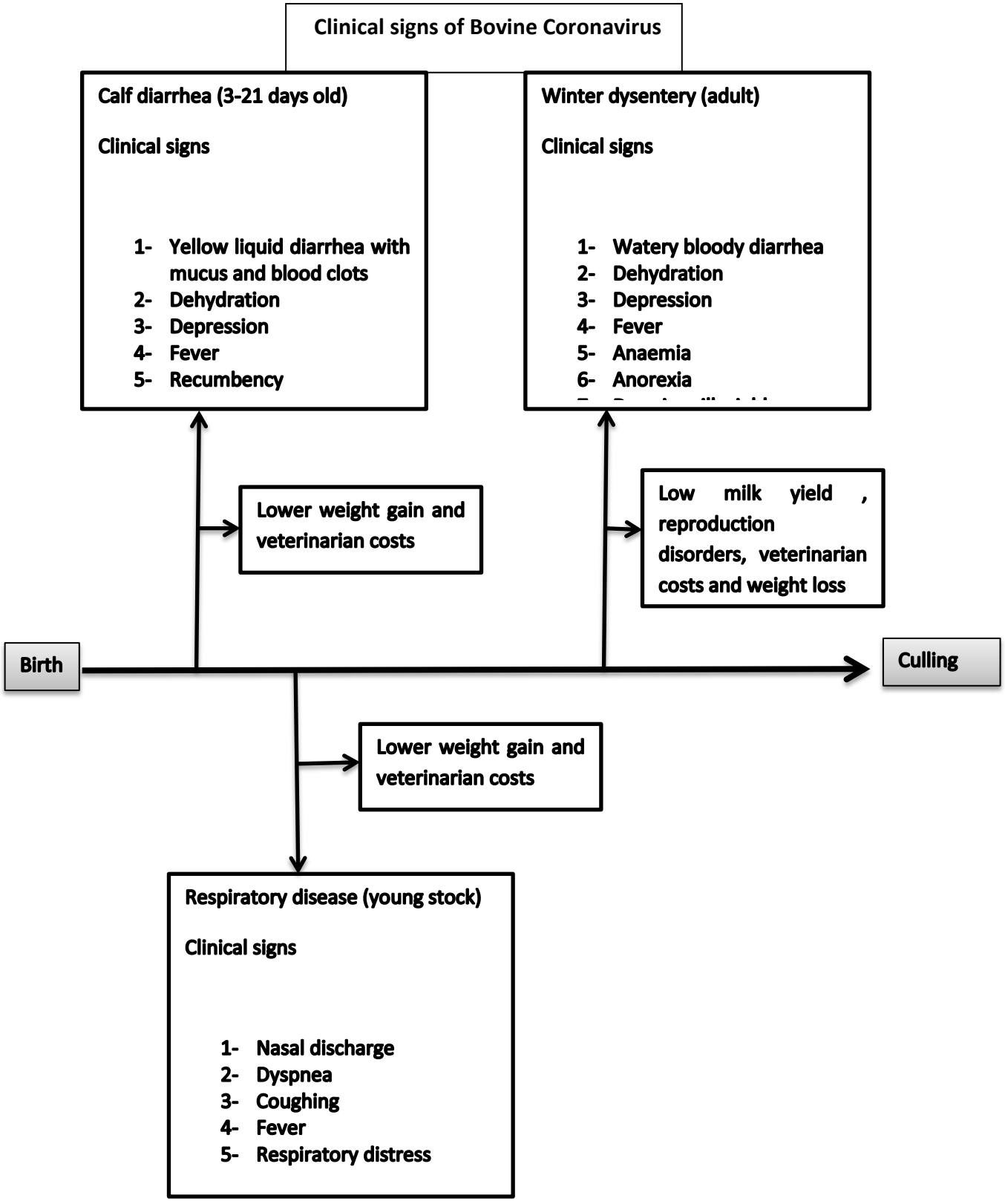
2-2_Pathogenesis

Bovine coronavirus enter through the faecal-oral route or inhalation of aerosol infected Animals and cause infection other healthy animal (Saif 2010 & Oma et al. 2016). The virus enter the cell by attached to its membrane receptors specifically by the S protein and the virus entry into the cell by turned the S protein, the host cell membrane undergoing fusion of the virus (Popova and Zhang 2002). The initial replication taken in the respiratory tract parts or the gastrointestinal tract, infect the intestine caused by swallowed virus protected by mucus (Saif 2010; Oma et al. 2016).

While the gastrointestinal tract is infected first and with viraemia the virus reaches to the respiratory tract (Park et al. 2007&Boileau and Kapil 2010). Detected with nested PCR in nasal discharge The duration of virus shedding can be stile extensive up to 932 days post-infection while in feces stile 1058 days (Kanno et al. 2018).

The main common route of the virus infection is from maternal (cow) to calf or between calves , between herds (Oma et al. 2016& Oma et al. 2018). The other carries recorded are the dogs (Erles et al. 2003; Boileau and Kapil 2010). The effected parts of gastrointestinal tract are the duodenum then passing to the large intestine lead to villous atrophy and other mucosal lesions (Mebus et al. 1973; Langpap et al. 1979; Park et al. 2007). While In the respiratory system it causes interstitial pneumonia (Park et al. 2007; Oma et al. 2016& Kalkanov et al. 2019).

2-3- Clinical signs



(Gunn, et al., 2009)

2-4 Diagnosis

The clinical signs are similarity of other various infectious agents, the signs is not sufficient for examination of calves or adult cow , the laboratory confirmation of specimens submitted Bovine respiratory coronavirus can only be identified the virus infection, antemortem samples for detection of infection in calves and adult cow include , and necropsy finding of the lungs we can see the distribution of virus in the lungs is focal (Tawfik Aboellail and Sanjay Kapil, 2000).

Immunohistochemistry and immunofluorescence used for isolation from Nasal turbinates and nasal glands have been found to be positive for virus antigen using. Oral infection in the subsequent in Spiral colon is the sample of choice for detection of virus due to the virus persists in that specific location for the longest time , about 2 - 5 gm of feces can be sent to the laboratory in wide-mouth jars it is important to delivery to increase the isolation of virus (Boileau and Kapil 2010;Daginakatte et al., 1999 and Craig & Kapil 1994) .

2-5 Treatment

There are no specific treatment recorded for the virus infections in beef or dairy cattle, but because viral infection can lead to development of secondary bacterial infection in the respiratory tract and this virus accompanied with other infections in clinical signs we must give parenteral antibiotic therapy administered early in the disease stage to avoids complication of bacterial pneumonia (Kapil ,et al ., 1994).

The use of nonsteroidal anti-inflammatory drugs (NSAIDs), currently labeled specifically for the control of fever has been shown to be useful in other viral pneumonias by improving clinical signs and prevent consolidation of lung (Boileau and Kapil 2010). Early therapies for treatment of bovine coronavirus

have included Vitamin C or B injection, probiotics and oral electrolytes (Apley,2008 & Apley, 1997).

2-6 Prevention

The prevention of bovine coronavirus based on vaccination and this important to limit the use of antibiotics and decrease the happens of antimicrobial resistance, the hygienic management to limit the shedding of the virus, the passive immunity adequate cannot be overstated and we must vaccinate the herds, to the prevention of diarrhea in calves used a modified live vaccine as oral vaccination (Boileau & Kapil 2010).

Also can using an intranasal vaccine calves to prevent the effect infection with virus (Plummer et al. 2004) . These virus are susceptible to heat, , chloramine T, detergents and disinfectants like sodium hypochlorite, povidone iodine, , glutaraldehyde, quaternary ammonium compounds, ethanol, phenolic compounds and formaldehyde (Sattar et al. 1989; Sattar and Springthorpe 1996).

The virus reported to survive at low temperatures and high relative humidity. Their survival on surfaces is also long, up to 120 h (Duan et al. 2003 & Geller et al. 2012).

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