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Bovine viral diarrhea - a BVD, mucosal disease

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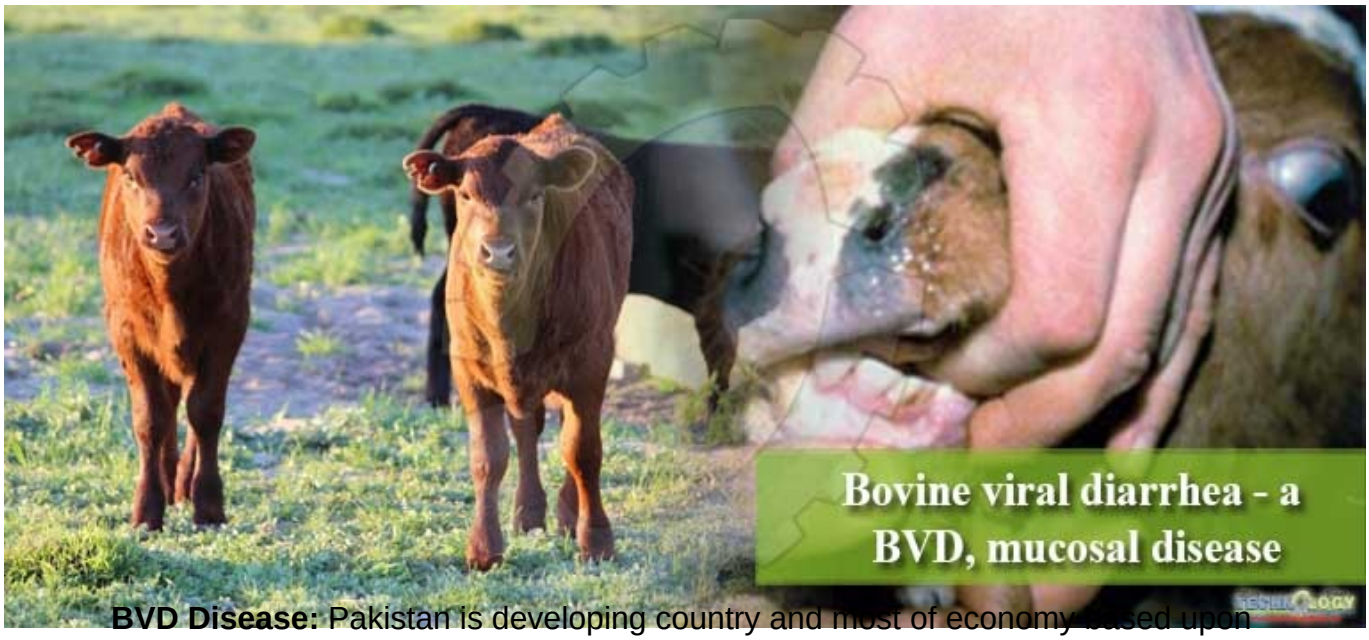
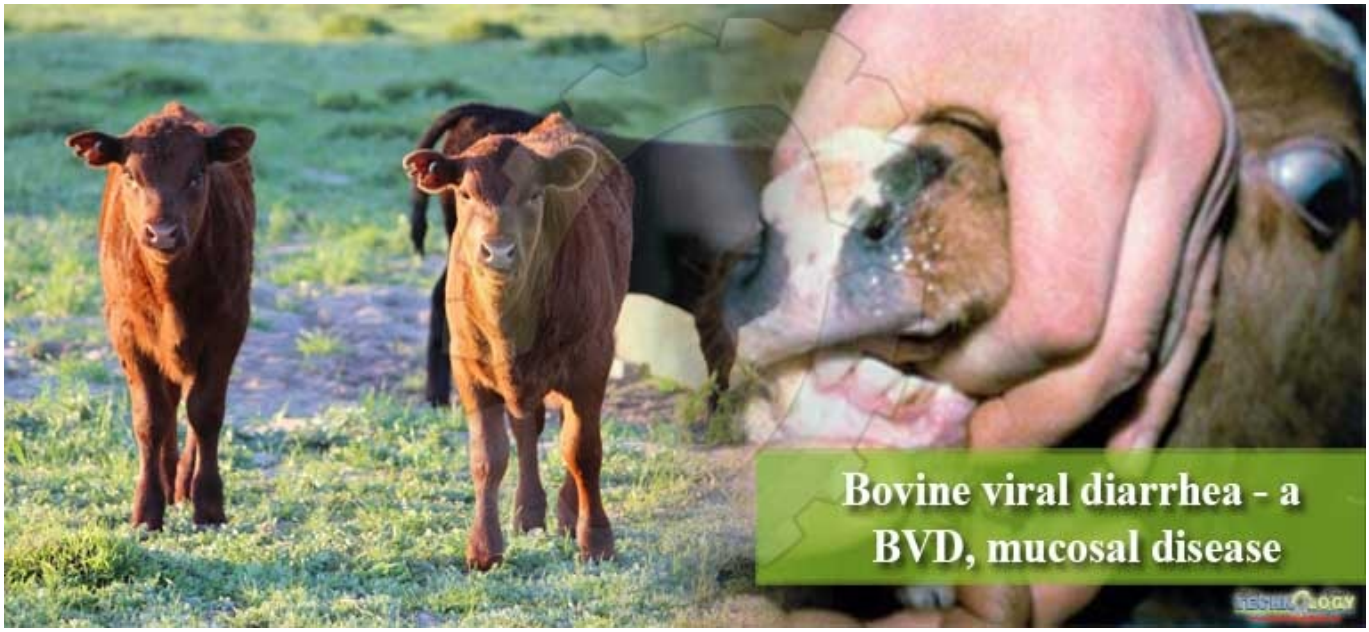


BVD Disease: Pakistan is developing country and most of economy based upon agriculture sector. Agriculture sector is playing major role to eliminate the poverty.



Agricultural sector provides the raw material to run other sectors such as different kinds of industries. This sector is facing lots of challenges such as change in weather (temperature, humidity, wind, precipitation, floods) and diseases (non-pathogenic and pathogenic). Livestock sector is major portion of agricultural sector.

In Pakistan more than 58 million families are depending upon livestock. Pakistan is blessed with lots of breeds of different animals. The important entities of livestock sectors are buffalo (black gold of Pakistan) cattle, goats (poor man cow), sheep and poultry.

All these are facing different infectious and non-infectious diseases. Infectious diseases spread from one animal to other animals and invade the large areas. Pakistan is importing different vaccines against various diseases from different countries. To maintain the cold chain and proper handling of vaccine and medicine is a difficult task.

2 Etiology:
This disease was reported in 1946 and in next 35 years it was assumed that this infection prior to onset of illness. BVD virus, fall in genus pestivirus and family Flaviridae. BVD virus is RNA virus having two biotypes one is non-cytopathic (NCP) other is cytopathic (CP). These biotypes are formed after checking the effect of virus on cultured material.

Non-cytopathic are important and common biotypes. Only these biotypes cross the placenta and affect the fetus. It causes the reproductive, enteric and congenital diseases. Most of cytopathic viruses are associated with mucosal diseases. Fatal disease causes 80-90% mortality when come in herd. Incidence rate of this disease is 5% but morbidity rate is 100%.

The cattle of 8 month – 2 year of age are more affected as compared to 6 month age. Mainly affects Intestine & GIT and cause erosive lesions in oral cavity, intestine and cause enteritis and perfuse acute diarrhea. The 25% of total cases occur in acute form and remaining per acute and chronic cases. When come in herd provide 100% long standing solid immunity.

Some strains are immuno suppressant and effect leucocytes (lymphocytes) & some strains are Immuno-tolerance and not detected by immune system of animal body. Virus is there but no receptor founded on lymphocytes for virus and no antibodies developed due to immune-tolerance of strain. Disease commonly occurs in winter season.

Mostly effects beef cattle and less in dairy animals. Virus also affects pregnant animal but no effect on conception and no early abortion because virus mostly affects in mid or 3rd trimester in pregnant animal and teratrogenic (Fetus get infection in uterus) effects on fetus. Late pregnancy leads shrinkage of fetus longitudinally.

This disease is spread through contamination from nasal secretion, urine and feces. From contamination virus come to alimentary tract and cause erosive lesion in intestine and also enter in to blood stream and cause viremia. Predilection site is intestine and may also affect the oral cavity.

When virus lodges, it leads edema development in mucosal epithelium of intestine, gastroenteritis and stomatitis of oral cavity. The inflammation of intestine and severe diarrhea causes death of animal due to severe dehydration.

The disease having three types which are named as Per-acute, Acute and Chronic. **Acute:** in the acute phase of disease there is high temperature 105-106 of (**Diphasic fever:** An illness

characterized by an early elevation in body temperature followed by a later one. It is often caused by systemic bacterial infection.) (**Note:** Diphasic temperature may occur in parasitic diseases or BVD).

Continues fever up to 4-10 days that is illness period in bovine of viral disease. The fall in milk production, anorexia, tachycardia, increase in respiration, peruse and watery diarrhea can be noticed in effected animals. The diarrhea remains persistent for 2-4 days in said disease.

In the feces foul swelling and mucous or blood can be seen and due to lesion in oral cavity, cooked appearance of oral cavity can be observed due to lesions in oral cavity. The lesion converted into necrotic lesions and excessive salivation is also there.

Lesion heal within 10-40 days, may be muco-purulant discharge from naries, lacrimation, corneal edema, ruminal stasis may occur, severe dehydration and emaciation leads to death of effected animal.

Per-acute: In the per-acute phase of disease there is no diarrhea but intestine distended due to mucous accumulation and animal die in 1-2 days without showing clinical signs. Discrete shallow erosions in oral cavity & intestine can be observed in some cases.

Chronic: Infected animal may remain carrier of virus for few months but the diarrhea may persist for several months after onset of disease. Anorexia, progressive emaciation, dehydration, dry body coat, may lameness in animals, shallow erosive lesions on secrotem, vulva, prepuceal orifice, in between legs & around dewclaw are most common sign and symptom of disease.

Animal may survive up to 18 months with all these lesions. Defective fetus and ocular agenesis, cerebral agenesis, musculoskeletal deformities, micro-cephally, atrophy of limbs, small lower jaw, alopecia, intra uterine growth retardation in fetus can be out comes of this diseases.

3 Differential diagnosis: Highly confusing disease, difficult to differentiate and differentiation can be done by cultured samples. This disease should be differentiated from Rinder pest (eradicated from Pakistan), Bovine Malignant Catarrh, Foot and Mouth Disease (FMD), Salmonellosis, Endo-parasitism and Arsenic poisoning. Treatment:

There is no treatment of viral diseases due to this we commonly give symptomatic treatment. Ringer solution should be injected to compensate the water and salt loses. Antibiotics should be given to avoid secondary infections and anti-diarrheal drugs are administered to decrease or to treat the diarrhea.

In perfuse diarrhea antibiotic should be given intravenously or intra-muscularly because orally given medicine will be flushed out with diarrhea. Chronic cases of this disease should be culled. The affected animals must be diagnosed and culled to save the remaining herd from infection.

Vaccine: The potential vaccination will protect the animal against viremia and target cell (reproductive and lymphatic cells) infection is also blocked. The T and B cells are arms of

immune system which become stronger after effective vaccination.

B-cells plays key role to neutralize the virus and promote the clearance of herd. Both live and modified virus vaccine are available and vaccination must be done at age of 6-8 month in beef calves.

A vigilant vaccination program must apply. If dam is not vaccinated properly than fetus is affected. It gives solid immunity for 3-5 years. Note: In viral disease corticosteroid diversely effect leucocytes and this leads to leucopenia in treated animals.

This disease can be prevented by following vaccination and bio security (prevent the disease agent to get enter into herd). Effected animals should be condemned after slaughtering to reduce the infection chances. New animals must be kept in separate sheds (Quarantine period) and monitor them. They may be source of disease in herd.