Fact Sheet: Bovine Nebovirus

P2f Infectious Diseases

August 2025

Bovine Nebovirus (BoNeV)

Bovine nebovirus causes scours in calves with varying severity, often accompanied by loss of appetite and lethargy. No vaccines or specific treatments exist. Control relies on hygiene and supportive care.

Transmission

BoNeV spreads mainly through direct contact between animals and the faecal-oral route: infected calves – even those without symptoms shed the virus in their manure for extended periods. It is spread to other calves when they come in contact with from contaminated feed, water and equipment.

Clinical signs and pathogenesis

Bovine nebovirus infections mainly affect young calves, causing diarrhoea that can range from mild to acute, along with loss of appetite, lethargy, and temporary weight loss. In some cases, malabsorption occurs, meaning calves may not properly digest certain nutrients, which can slow growth and affect overall condition.

Treatment and control

There are no commercial vaccines or specific treatments for BoNeV. Management focuses on supportive fluid therapy for diarrhoea and strict hygiene measures, such as cleaning pens and separating calves, to reduce transmission.

Post-mortem, pathological findings

Bovine nebovirus primarily affects the upper small intestine (duodenum and jejunum), causing villus atrophy, crypt hyperplasia, and mucosal inflammation. Viral replication occurs in the intestinal epithelial cells. These changes impair nutrient absorption, leading to diarrhoea and poor growth. Rarely, severe cases may show necrotizing hepatitis and intestinal haemorrhages.

Key points

- Bovine nebovirus (BoNeV) is an enteric calicivirus affecting mainly young calves.
- It causes scours of varying severity, often with loss of appetite and lethargy; malabsorption may occur.
- The virus targets the upper small intestine, causing villus atrophy and crypt hyperplasia.
- It is spreads via the faecal-oral route; asymptomatic calves can shed the virus.
- No vaccines or specific treatments exist; control relies on hygiene and supportive care.
- Research is limited due to lack of cell culture systems and diagnostic tools, leaving its full pathogenic role unclear.

Microbial surveillance in dairy cattle

This series of fact sheets has been prepared for cattle vets. It covers a range of microbes that were identified by Dairy UP team in samples collected from cattle on NSW dairy farms in 2023 and 2024. As many of these viruses are new, and knowledge about them is still emerging, we have collated current knowledge as a handy reference.

About Dairy UP

Dairy UP is a research and development program to help NSW farmers unlock the potential of their dairy businesses. Led by the University of Sydney's Dairy Research Foundation, Dairy UP is delivered through NSW DPIRD, Scibus, Dairy Australia, and the University of Sydney.

Laboratory detection

RT-PCR is the primary tool for detecting BoNeV. Other methods include electron microscopy, immunofluorescence, and antigen capture ELISA, though commercial diagnostic kits are not widely available.

Genetics

Bovine nebovirus (BoNeV) is an enteric virus belonging to the genus *Nebovirus* in the family *Caliciviridae*. It is genetically distinct from bovine

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noroviruses but shares similar structural features typical of caliciviruses. BoNeV is a recognized enteric pathogen in cattle, especially young calves, and has been linked to diarrhoea outbreaks. It may act alone or in combination with other gut pathogens.

Bovine nebovirus (BoNeV) includes two main genotypes: the Nebraska (NB) strain from the USA and the Newbury1 strain from the UK. A related virus, Kırklareli virus, has been detected in Turkey and is genetically closest to neboviruses, though it is not officially classified as one.

Research challenges

Its exact pathogenic role is unclear, it could be a primary pathogen, co-infective agent, or commensal. No cell culture system, reverse genetics tools, or animal models exist for detailed study. Limited diagnostics hinder epidemiological understanding, and its overall impact on calf health and productivity needs further investigation.

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More info

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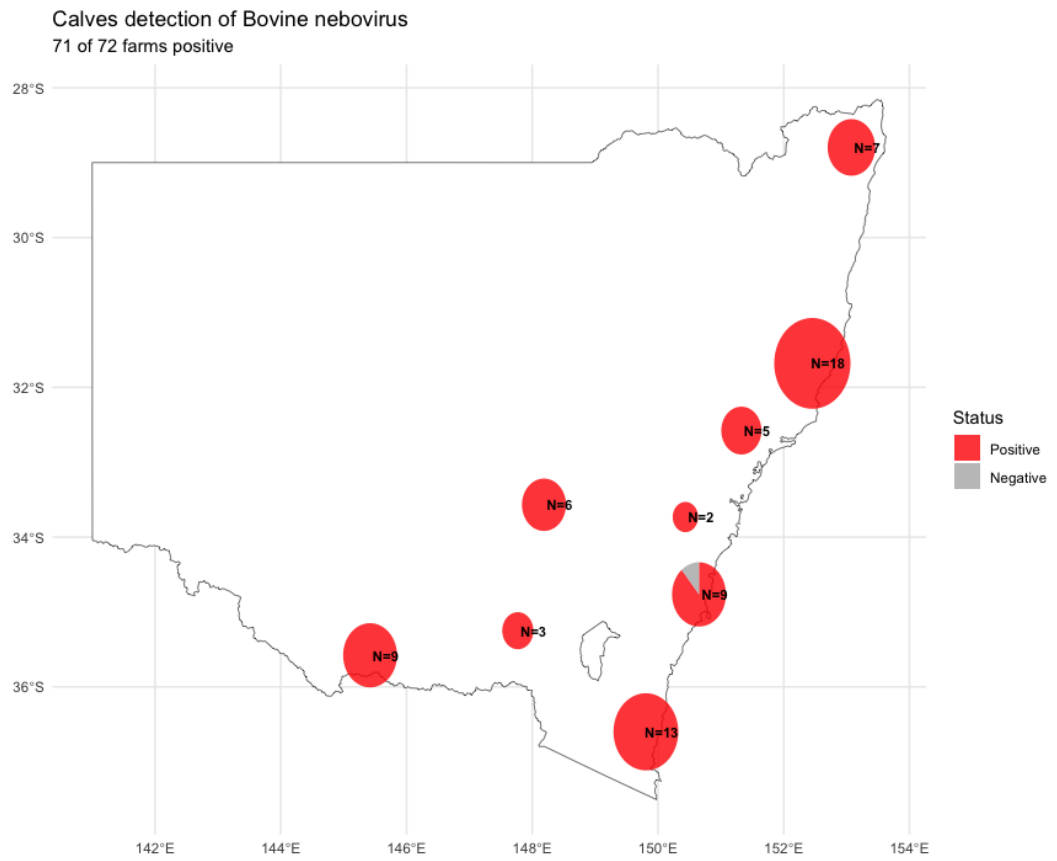

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