Bovine Viral Diarrhoea (BVD)

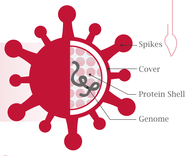
BVD is the most prevalent infectious disease in cattle and causes a significant negative economic impact. The mechanism of disease is complex, with different clinical manifestations for transient and persistent infections. Diagnostic tools, using specific antibody and virus detection techniques, are available to assess the BVD status of herds.[1,2]

BVD Virus[1]

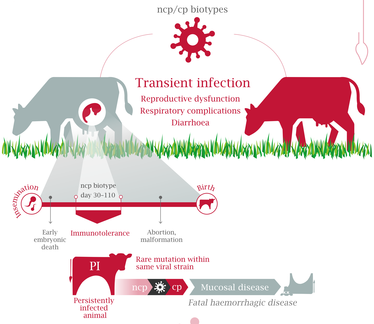
Taxonomy: *Flaviviridae pestivirus*

Genotypes: BVD type 1 and BVD type 2

Biotypes: Cytopathogenic (cp) and non-cytopathogenic (ncp)

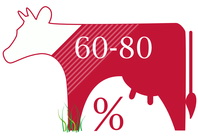


Mechanism of disease[1,2]

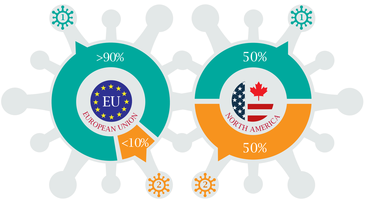


Prevalence

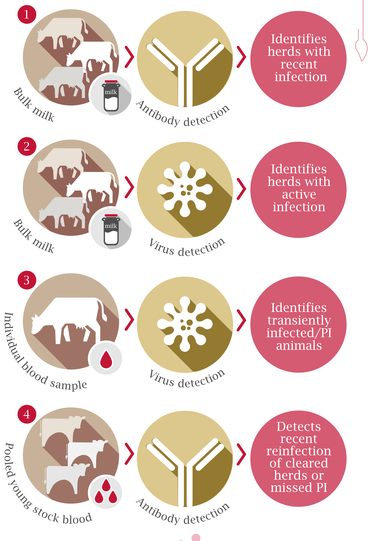
Herd level seroprevalence in the EU[2]



Prevalence of BVD type 1 and 2[3,4]

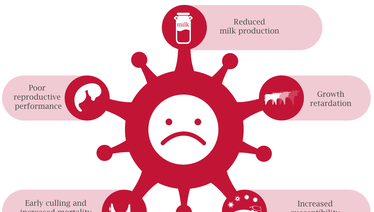


BVD farm status: means of diagnosis[1]



Economic impact of BVD[3,5]

BVD infection can have a negative economic impact through:



References

❶ Peterhans E, Bachofen C, Stalder H, et al. Cytopathic bovine viral diarrhea viruses (BVDV): emerging pestiviruses doomed to extinction. Vet Res. 2010;41:44. ❷ Lanyon SR, Hill FI, Reichel MP, et al. Bovine viral diarrhoea: Pathogenesis and diagnosis. Vet J. 2014;199(2):201-9. ❸ EU Thematic network on control of bovine viral diarrhoea virus (BVDV). BVDV Control QLRT – 2001-01573 Position paper. ❹ Lindberg A, Brownlie J, Gunn GJ, et al. The control of bovine viral diarrhoea virus in Europe: today and in the future. Rev Sci Tech. 2006;25(3):961-79. ❺ Saatkamp HW, Beek PMJG, Moen AR, et al. Financial economic analysis of Bovine Viral Diarrhoea Virus control in Dutch dairy herds. Proceedings of the 12th International Symposium on Veterinary Epidemiology and Economics, Durban, South Africa, 2009.

Current management options

Ongoing BVD control schemes aim to:

1. remove PI animals from infected herds;
2. prevent the introduction of BVD virus in free herds (using live or inactivated vaccines);
3. monitor BVD status over time.

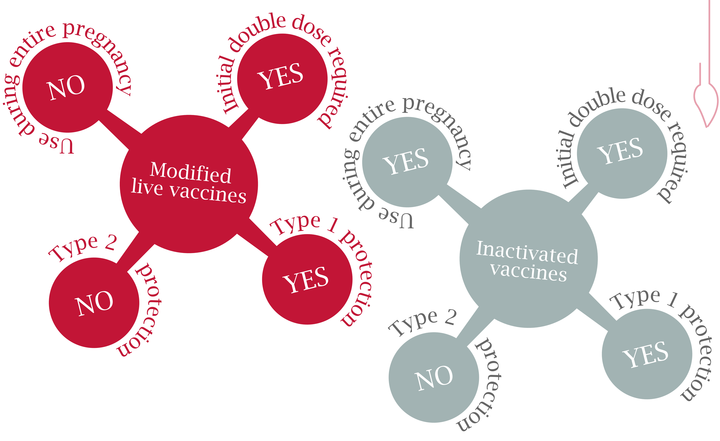
Eradication programmes in the EU have been applied variously at national, regional and herd level.

Management strategies in the EU[1]

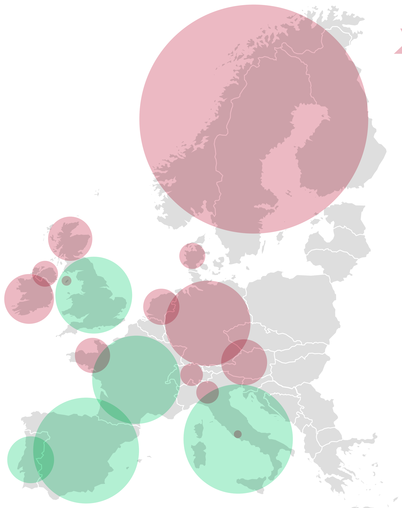
Essentials for a successful BVD management strategy:

1. Removal of PI animals before vaccination
2. Vaccination of cattle must induce broad and long-lasting immunity
3. Vaccination of female cattle must confer foetal protection and must be safe during pregnancy
4. Promotion of safe trade
5. Surveillance

Current vaccination options in the EU[1]



Eradication plans in the EU[1]



National/regional programmes

- Nordic countries (DK, FI, NO and SE)
- Austria
- Netherlands
- Germany
- Scotland
- Ireland
- Northern Ireland
- Brittany
- Rome, Lecco and Como
- Switzerland

Herd-to-herd programmes

- England
- France
- Italy
- Spain
- Portugal

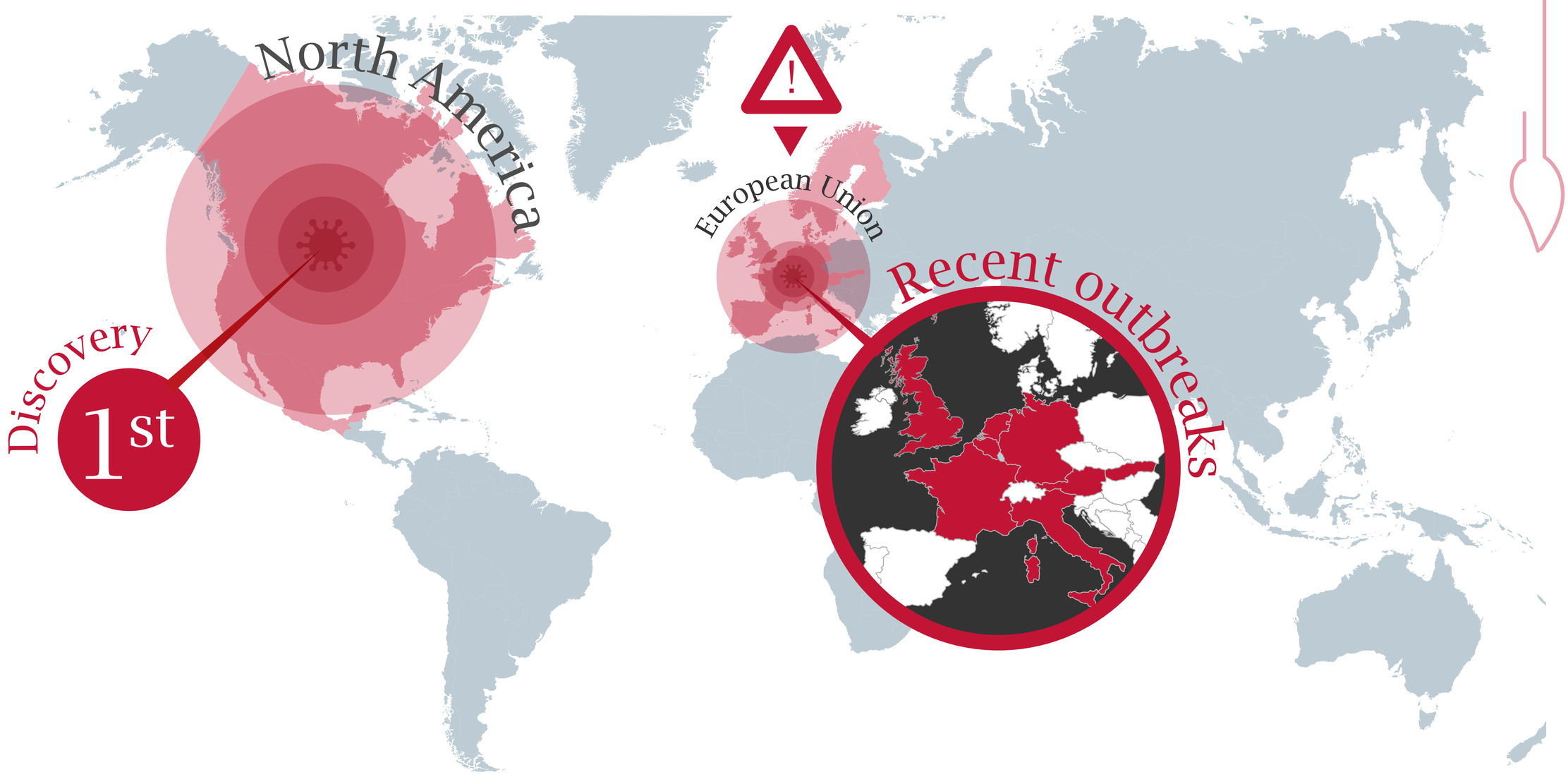
Reference

1. EU Thematic network on control of bovine viral diarrhoea virus (BVDV). BVDV Control QLRT – 2001-01573 Position paper.

BVD type 2

BVD type 2 was first identified in North America, where it accounts for around 50% of infections. Although it is currently less prevalent in the EU (<10% of infections), recent outbreaks suggest that BVD type 2 is an emerging threat in the region.

BVD type 2: an emerging threat in the EU[1]



References

1 EU Thematic network on control of bovine viral diarrhoea virus (BVDV). BVDV Control QLRT – 2001-01573 Position paper.

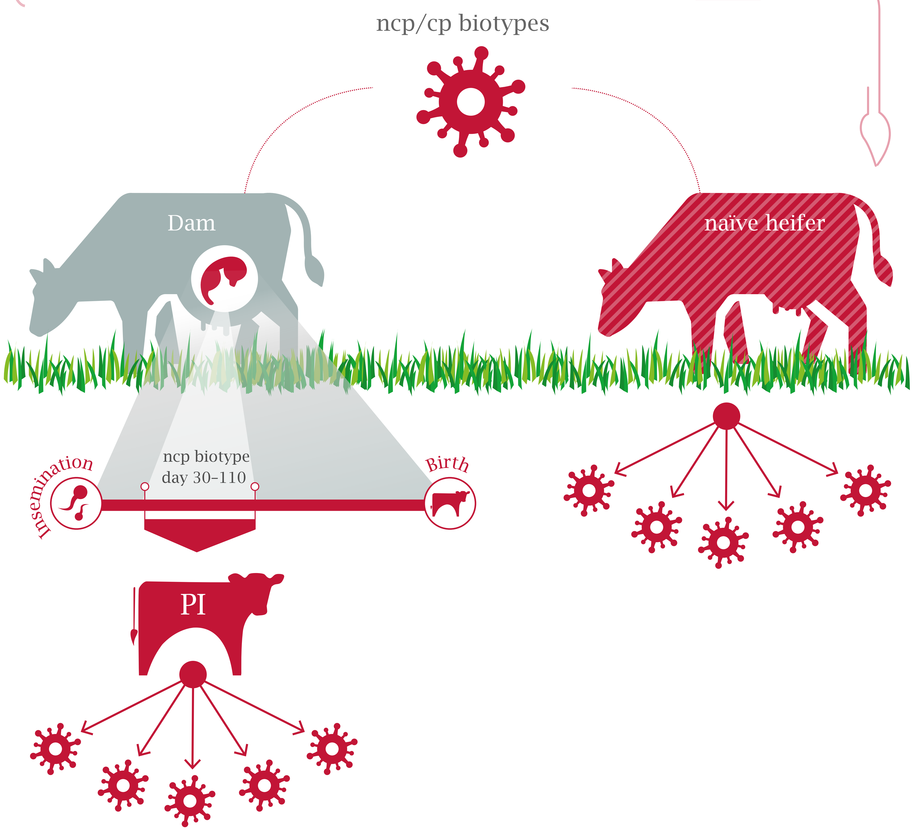
Cycle of infection

BVD control programmes have so far failed to eradicate the disease except for the Nordic countries. This failure has been attributed to poor programme management and to the limitations of available vaccines. The cycle of BVD infection is perpetuated by PI animals and naïve heifers – both are key to the spread and maintenance of disease in herds.

Why control programmes have failed to eradicate BVD[1]

1. Antigenic variation
2. Incorrect use of vaccines
3. Failure to remove PI animals
4. Failure to adhere to control strategies
5. Spread of BVD infections by injectables
6. Lack of marker vaccines against BVD

BVD outlook[2,3]



References

❶ EU Thematic network on control of bovine viral diarrhoea virus (BVDV). BVDV Control QLRT – 2001-01573 Position paper. ❷ Lanyon SR, Hill FI, Reichel MP, et al. Bovine viral diarrhoea: Pathogenesis and diagnosis. Vet J. 2014;199(2):201-9. ❸ Peterhans E, Bachofen C, Stalder H, et al. Cytopathic bovine viral diarrhea viruses (BVDV): emerging pestiviruses doomed to extinction. Vet Res. 2010;41(6):44.