



BOVILIS
a world of protection



**Bovilis® stops BVD from biting
into your productivity.**

BVD and DAIRY

BVD and dairy production

BVD is widely recognised as the most important viral cattle disease in New Zealand.

About 80% of New Zealand herds and 60% of cattle have had exposure to BVD virus.

Around 15% of dairy herds have active infection at any one time.

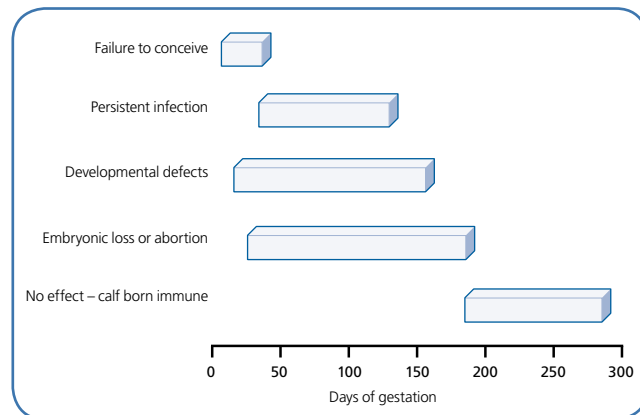
BVD infection in adult dairy cows can cause reproductive wastage, weight loss and reduced milk yield. BVD is also immunosuppressive, meaning cattle that have an active infection will have an immune system that cannot protect them from other diseases.

BVD infection has a major impact during mating and pregnancy. BVD causes infertility, embryo loss, abortions (slips), stunted and deformed calves, and the birth of dead calves. BVD does the most damage when it infects pregnant cows. If a cow contracts BVD while she is pregnant, she may give birth to a Persistently Infected (PI) calf. PI animals are the main source of infection within the herd.

How does the virus affect pregnant cows?

Reproductive wastage occurs when a heifer or cow becomes exposed to BVD virus for the first time when it is pregnant. The outcome depends on when the pregnant cow is infected.

Fig. 1. Effects of BVD infection at different stages of pregnancy.



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Persistently Infected (PI) animals

As the name suggests, a PI (Persistently infected) is an animal that continually sheds the BVD virus all its life. Some PI animals can be recognised by vets and farmers as sickly animals.

A PI is a calf that is infected as a foetus (*in utero*) between approximately 30 to 125 days of gestation. This is the period of time during which the immune system of the foetus is still not fully developed. The calf becomes immunotolerant to the virus, meaning that it does not recognise the virus as something 'foreign'. The PI calf becomes a continuous shedder of the virus and is the key component in the spread of the disease.

PI animals often succumb at a relatively young age to Mucosal Disease, or other diseases associated with BVD, e.g. Pneumonia. It is estimated that about half of all PI cattle die within the first 12 months of life. 80% are dead by two years.

However, some PI animals appear normal, survive longer than 18 months and act as long term carriers of BVD virus, continuing to infect those naïve animals in the herd not yet exposed to the virus. These PI animals do not show obvious signs of illness and are difficult to recognise. They can breed successfully but their progeny are always PI, thus perpetuating the disease in the herd.

Surviving PIs make up 1% of the adult cattle population.

Transiently Infected (TI) animals

Transiently Infected (TI) animals are those animals who have an active BVD infection, but who will recover. The disease is essentially 'passing through', but in doing so, adversely affects production.

A transient infection will generally last 2–3 weeks, and will invariably pass unnoticed by the farmer. The most important effect of a transient infection is reduced conception rates. Some studies have also found that transient BVD infection can reduce milk production in a cow by up to 10%.

Transient infection is the most frequent infection type in a herd. When there are a number of TI cows in a herd, this is often when BVD has a very large economic effect.

TIs can pass the virus on to naïve animals; however they are only a minor source of infection when compared to PIs.

Transient infection leads to long-lasting immunity (about 6 years). This is one of the reasons why BVD infection in dairy herds follows a cyclical pattern. Herd immunity increases as older immune cows are culled, and decreases as new naïve heifers are introduced.



PI animals are the most important source of infection on a farm.

How does BVD spread?

It can take as little as one hour of contact with a persistently infected animal to transmit the BVD virus to an uninfected animal.

Infection commonly occurs either through direct contact (nose to nose) with a PI or ingestion of faeces containing the BVD virus. Other possible routes of transmission are semen, milk, saliva, urine, placenta and birth fluid.

It is also possible for the BVD virus to be spread through yards, stock trucks and to be carried around on footwear. The virus can survive in the environment for up to 7 days.

Once contact has taken place the virus replicates inside the epithelial cells and spreads as a free virus within infected blood cells, penetrating different tissues in the body.



The cost of BVD

As knowledge about BVD increases both in New Zealand and internationally, researchers and scientists have been able to show the cost of BVD in an average infected dairy herd¹.

In the calculation below, productivity losses due to BVD have been extrapolated with New Zealand industry averages¹, estimates and current dairy milk solid payouts².

Statistics for an average New Zealand dairy herd.

Average herd size	325 cows ²
Dairy payout	\$5.20/kgMS ³
Average production per cow	1.41/kgMS per day ²
Average days in lactation	260 days ²
Cost of cow replacement	\$1,000
Net value of 2 year old	\$500
Net value of weaner calf	\$100

1. Heuer C, Healy A, Zerbini C. Economic effect of exposure to bovine viral diarrhoea virus on dairy herds in New Zealand. *Journal of Dairy Science*. 90, 5428-38, 2007.

2. Livestock Improvement Corporation.

3. Fonterra forecast 29 April 2009.

Production losses in an actively infected BVD herd per year

Cows take an average 2.4 days longer to conceive (2.4 days x 1.41/kgMS/day x \$5.20/kgMS x 325 cows)	\$5,700
Cows average 0.074/kgMS less per day (0.074/kgMS x 260 days of lactation x \$5.20/kgMS x 325 cows)	\$32,500
On average 2.03% cows will abort and be culled (2.03% x 325 cows x \$1,000 cost of replacement)	\$6,600
On average 2.03% cows will abort and lose calf (2.03% x 325 cows x \$100 net value of 100kg calf)	\$750
On average 25% of PI cattle die before 2 years of age (1.33% x 325 cows x 25% mortality x \$500 net value of 2 year old)	\$540
Culling of PI cattle over 2 years of age (1.33% x 325 cows x 75% survival x 69% extra cull rate x \$1,000 cost of replacement)	\$2,240
Annual cost of BVD in an infected herd	\$48,330
Annual cost per cow in an infected herd (Excludes cost of grazing and inductions)	\$148

The major economic costs associated with BVD are reduced milk yield and the culling of unproductive stock. With an estimated **15%** of New Zealand dairy herds having active infection, it makes strong economic sense to eliminate BVD from your herd, and protect your herd from new BVD infection.



It can take as little as one hour of contact with a persistently infected animal to transmit the BVD virus to an uninfected animal.

Bovilis BVD – breaking the BVDV cycle

BVD in dairy herds is often cyclical. This is a process of infection (where the cost of BVD is involved), followed by a rise and then a fall in immunity. This is followed again by another round of infection.

Bovilis BVD makes a vaccination-led control programme possible. Bovilis BVD breaks the cycle of BVDV infection. With Bovilis BVD, vaccinated animals are protected from infection, and the birth of new PIs is prevented.

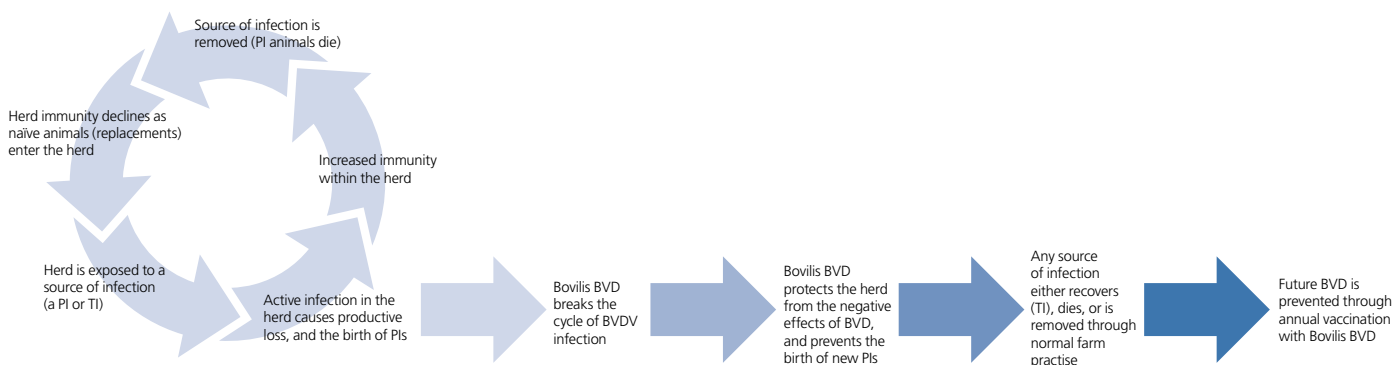
Vaccination with Bovilis BVD gives BVDV nowhere to go.

Breeding stock should be vaccinated before mating. Primary vaccinations are given to animals at approximately 2 months before mating, followed by a booster (2mL) 4 weeks later.

To maintain immunity, re-vaccinate all cattle annually with a single dose (2mL) approximately one month before each mating.

**Bovilis BVD is the serious solution
for a serious disease.**

Fig. 2. BVDV infection cycle in dairy herds.



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Phone: 0800 800 543. BVD-321-2009.