

**BOVILIS**  
a world of protection



**Bovilis<sup>®</sup> stops BVD from biting  
into your productivity.**

**BVD and BEEF**

## BVD in beef herds

**BVD (Bovine Viral Diarrhoea) is a viral disease that affects cattle. A recent New Zealand study<sup>1</sup> has shown that BVD is very common in New Zealand beef herds. Around 65% of New Zealand beef herds have active BVD infection and about 80% of herds have had exposure to BVD virus.**

BVD infection in adult cows can cause reproductive wastage, weight loss and reduced milk yield. In young stock (3–12 months), BVD can have a range of effects, including weight loss, loss of body condition and the premature death of Persistently Infected (PI) animals.

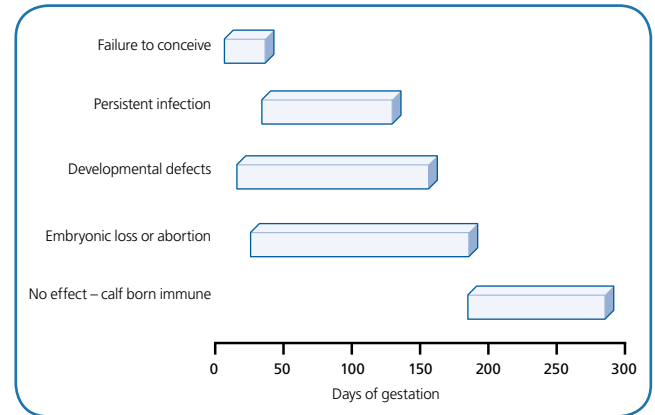
BVD is also immunosuppressive, meaning cattle that have an active infection will have an immune system that may not protect them from other diseases.

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.**



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

## How does the virus affect young stock?

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In young cattle (3–12 months) BVD symptoms include:

- ▶ A rough coat and a loss of body condition.
- ▶ Depression.
- ▶ Reduced appetite.
- ▶ Nil or poor weight gain.
- ▶ Scouring in a large number of the mob.
- ▶ Coughing.
- ▶ Discharge from the eyes and nose.
- ▶ Ulcers in the mouth and between the toes (sometimes).
- ▶ Sudden onset of severe disease and the premature death of Persistently Infected (PI) animals.

Some animals will not show symptoms except some reduced weight gain. BVD in young stock is frequently not diagnosed because symptoms can be similar to parasitism. Some farmers therefore drench without getting a diagnosis. Most stock recover after BVD infection, leaving farmers with the false impression that their stock have responded to the drench.

## Persistently Infected (PI) animals

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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 from 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.



**It is estimated that about half of all PI cattle die within the first 12 months of life.**

**80% are dead by two years.**

## Transiently Infected (TI) animals

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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 effects of a transient infection include reduced conception rates, and more frequent and severe clinical diseases such as mastitis and endometritis.

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 does however lead to long-lasting immunity (about 6 years).

## How does BVD spread?

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It can take as little as one hour of contact with a persistently infected animal to transmit 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 via 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.



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

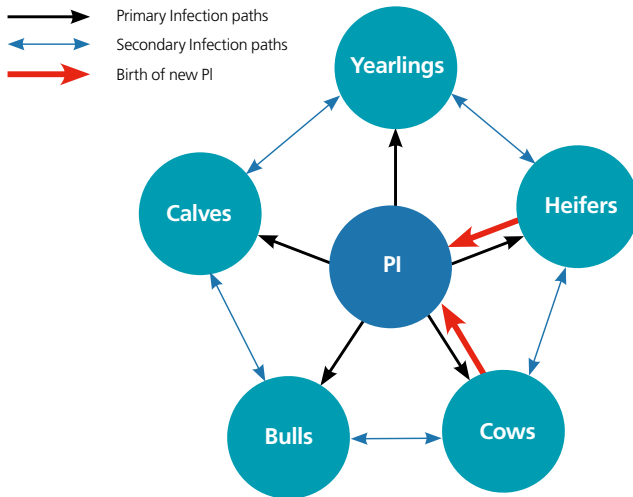
## How does BVD behave in beef herds?

BVD behaves differently in beef herds than it does in dairy. In dairy herds, calves – including PIs – are removed from their mothers, only to return to the milking herd a couple of years later. This leads to a regular cycle of re-infection every few years.

But in suckler herds, calves and cows are kept together. This allows a much more dynamic spreading of the disease, back and forth between younger and older animals. This means that PIs can be in constant contact with susceptible new calves, replacements, bulls and the breeding herd.

A PI calf in a beef herd can have devastating effects. They are with the cows at the stage of pregnancy when the cow is most susceptible to the effects of BVD infection. The calf spreads millions of virus particles every day and can infect many cows, causing early foetal loss or the development of even more PI calves.

**Fig. 2. BVD virus circulation in a beef herd.**



## Reproductive losses due to BVD in beef herds<sup>1</sup>

BVD virus infection is very widespread in New Zealand beef herds (with approximately 65% of herds having active infection), much higher than in dairy cattle.

A study on the effects of reproductive diseases found that between mating and pregnancy testing, BVD had the effect of reducing overall pregnancy rates by an average of 5% in herds that had active infection.

Data also suggests that about 2% of New Zealand beef herds will experience a decrease in pregnancy rates of at least 15% due to BVD.

These figures do not include abortions that may have been caused by BVD virus.

Now consider the cost of BVD in an infected beef herd. Assume weaner heifers and steers average \$400 each, and the replacement cost of an empty cow is \$200.

With a **5% lower pregnancy rate** in an infected herd of 100 cows (and 25 replacements), the annual cost of BVD is:

Loss of weaners (5 x \$400)	=	\$2,000
Replacement cost of empty cows (5 x \$200)	=	\$1,000
<b>Total cost/100 cows/year</b>	=	<b>\$3,000</b>

In cases of high BVD infection, a **reduction in pregnancy rates of at least 15%** is possible. The annual cost of this in a herd of 100 cows would be:

Loss of weaners (15 x \$400)	=	\$6,000
Replacement cost of empty cows (15 x \$200)	=	\$3,000
<b>Total cost/100 cows/year</b>	=	<b>\$9,000</b>

1. Heuer et al., 2008. Effect of reproductive pathogens on pregnancy rates in beef herds. Proceedings of the 38th Seminar of the Society of Sheep and Beef Cattle Veterinarians NZVA, May 2008, page 141–147.

## Bovilis BVD – breaking the BVDV cycle

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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 (including bulls) 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.
- ▶ Young stock can be vaccinated from 4 months of age onwards. For the primary vaccination, animals should be given a single dose (2mL) followed by a booster (2mL) 4 weeks later.

**With Bovilis BVD, vaccinated animals are protected from infection, and the birth of new PIs is prevented.**



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