



BVD Control in Dairy Cattle

BVD

BVD STEERING COMMITTEE

Working to free New Zealand cattle farms from BVD

BVD is one of the most important viral diseases of cattle in New Zealand.

Recent advances in testing have shown that BVD is a serious and widespread issue. We now know that at least 60% of dairy and beef cows have been exposed to BVD, which is causing significant production losses.

Estimates put the annual losses for our dairy farmers at around \$127 million, while for our beef farmers, the cost is around \$3000-\$9000 per 100 cows in infected herds.

Since 2005, the BVD Steering Committee has been an industry leader influencing BVD research, diagnostic testing developments and awareness of BVD. Our aim is to deliver best practice BVD information, management tools and resources to help cattle veterinarians and farmers make decisions that best meet the needs of individual farm situations.

This brochure has been developed to give farmers comprehensive information on the effects of BVD infection, and introduce some management options available to minimise the risk and impact of BVD on your cattle farm and business.

With the assistance of your veterinarian and their BVD Management Toolkit, you can now develop appropriate programmes to define, manage and monitor BVD on your farm.

BVD is not only a threat to individual farmers, but also to New Zealand's economy, which still depends on our primary sector for growth. Our aim is to ensure New Zealand's rural veterinarians and cattle farmers have all the information needed to effectively test for and control BVD.

Let's take action to control BVD on our cattle farms.



BVD STEERING COMMITTEE

Working to free New Zealand cattle farms from BVD

Overview statements

- ❑ Bovine Viral Diarrhoea (BVD) is widespread. Most dairy herds in New Zealand have been exposed to this virus.
- ❑ It causes reproductive losses, an increase in general disease, reduced growth rates and lowered milk production. Losses are estimated at \$70,000 per infected average-sized herd per year.
- ❑ Most of the BVD effects go undetected by the farmer.
- ❑ The disease is maintained in a herd and spread to other herds by persistently infected (PI) animals.
- ❑ PI animals excrete large amounts of the virus throughout their lives. This occurs when an early pregnant (fetus < 4 months old) naïve cow gets infected with BVD. The resulting calf is born PI.
- ❑ To control the disease, you must prevent the formation of PI calves by making sure that early pregnant cows do not become infected with the virus.
- ❑ Control is a 4-step process.
 1. **Define** if BVD is in the herd.
 2. **Assess** the level of risk for your farm.
 3. **Action** a control plan to mitigate these risks.
 4. **Monitor** to make sure it is working.Ask your vet to work through this with you.
- ❑ Controlling this disease will have many benefits for you and your stock.
- ❑ Vets have the tools to assist you to control this disease.

BVD – the most important viral disease of cattle in New Zealand

BVD (Bovine Viral Diarrhoea) is not an emerging or new disease, but like many diseases, with more knowledge and improved testing, the effects of BVD virus have become apparent. Recent New Zealand research has given a clearer picture of the role BVD virus plays in cattle production. BVD is a hidden disease preventing full production in a number of ways, often without attracting the attention of the farmer or vet.

The prevalence of BVD virus in New Zealand is now well defined:

- About **80%** of New Zealand dairy and beef herds have had exposure to BVD virus.
- At any one time, at least **15%** of dairy herds have active virus infections.



What is BVD?

BVD infection in adult dairy cows can cause reproductive wastage, weight loss and reduced milk yield. BVD also causes immune suppression, meaning cattle that have an active infection will be more likely to succumb to other diseases. BVD infection can have major impacts during mating and pregnancy. It can cause infertility, embryo loss, abortions (slips), small slow-growing calves, deformed calves, and the birth of dead calves. The most damage is done when BVD infects pregnant cows. If a cow contracts BVD in the first 4 months of pregnancy, she may give birth to a Persistently Infected (PI) calf. PI animals are the main source of infection within the herd.



The effects of BVD on your farm

Main effects of BVD

- ❑ Depressed herd reproductive performance.
- ❑ More cases of general disease in cows and calves (mastitis, scouring, pneumonia etc).
- ❑ Reduced milk production.
- ❑ Reduced growth rates in young stock.

BVD affects production throughout the farming year. Possible effects are listed as follows.

BVD effects during mating and pregnancy:

- Increased number of services required per conception.
- Increased time between calving and conception.
- Increased number of non-pregnant cows.
- Immune suppression can make cows more susceptible to other reproductive diseases e.g. Neospora abortion.
- Temporary infertility in bulls caused by transient BVD virus infection.
- Cows infected with BVD virus during the first 4 months of pregnancy can give birth to a PI calf. This may result in a large number of PI calves if exposed cows are naïve.

BVD effects during lactation:

- Decreased milk production and possible weight loss.
- Immune suppression can make cows more susceptible to other diseases such as mastitis.

BVD effects during calving:

- Increased calving spread owing to failure of conception and fetal losses.
- Increased number of cows to be induced.
- An unexpected number of empty cows owing to abortion.

Calf effects and losses due to:

- Abortions and premature births.
- Stillbirths.
- Birth of weak or dummy calves.
- Congenital birth defects.
- Birth of PI carrier animals.
- Poorer subsequent fertility in heifer calves infected in later pregnancy.
- Birth of small calves with poor growth rates.

BVD effects on young stock:

- Reduced appetite.
- Scouring.
- Rough coat and a loss of body condition.
- Poor weight gain.
- Coughing.
- Ulcers in the mouth.
- Premature death of PI animals.
- Calves that are generally more difficult to get to weight targets.

Persistently Infected (PI) animals

As the name suggests, a PI animal is an animal that continuously sheds the BVD virus all its life. PI animals result from infection as a fetus (in the uterus) during the first 4 months of gestation. This is the period of time during which the immune system of the fetus is still not sufficiently developed. The calf becomes immune tolerant to the virus, meaning that it does not recognise the virus as something 'foreign'. A PI animal cannot produce antibodies to BVD virus and won't respond to vaccination.

A PI animal is always born that way and never created after birth. After birth, the PI calf becomes a continuous shedder of the virus all its life and is the key component in the spread and continuation of this disease. PI animals often die at a relatively young age from their infection (often called Mucosal Disease) or from other secondary diseases such as pneumonia.

On average 50% of PI cattle die before they are 2 years of age. However, some survive a lot longer and act as long-term carriers of BVD virus, continuing to infect the other animals in the herd. Although some PI animals are sickly or small, others appear normal and do not show signs of illness, and can only be diagnosed by being tested. They can breed successfully but their progeny are always PI, thus continuing the disease in the herd. Surviving PI animals make up less than 1% of the adult cattle population.

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

Key points about PI animals

- PI animals are always born. They are never created after birth.
- They are the main source of infection on farm because they are a 'virus factory' and spread large amounts of virus for their entire lives. Control them and you control the disease.
- They have much higher death rates than non-PI cattle.



Transiently Infected (TI) animals

Most animals that become infected with BVD virus for the first time will develop a transient infection. The only animals that don't are fetuses that are less than 4 months of age (in utero). As defined above, these become PI animals.

A transient infection is a BVD infection that lasts for about 2 weeks and is followed by a strong immune (antibody) response that usually lasts for several years. These animals remain immune to further infections for several years. All cattle that become infected with BVD virus will develop a transient infection as long as they are a fetus older than 4 months. For example, BVD infection of a 180 day fetus or 6 month calf or adult cow can only result in a transient infection. A naïve cow that is 60 days pregnant will become transiently infected (TI) when exposed to BVD virus, whereas her fetus will be born PI if it's not aborted.

Transient infection is the most frequent infection type in a herd. The greater the number of TI animals in a herd, the greater the economic effects. TI animals may pass the virus on to naïve animals; however, they are only a minor source of infection relative to PI animals. This is because TI animals shed only small amounts of virus, and only for a short period of time.

Key points about TI animals

- Transient infections occur in all cattle infected after the 4th month of gestation (4 month old fetus).
- Transient infection in early pregnant cows is the main way that PI animals form. The only other way a PI animal is formed is when a PI cow gives birth to a PI calf.
- Once an animal recovers from a transient infection, it will be immune to further infection for several years.
- TI animals may be a minor source of infection for other cattle.



How does BVD spread?

PI animals continuously shed millions of viral particles through their skin, saliva, nasal secretions, semen, milk, urine, faeces etc. They are 'virus factories'.

Direct animal-to-animal spread is the most common way an animal becomes infected. This can be via semen, milk, saliva, urine, faeces, placenta and birth fluid. The indirect spread of BVD virus through communal stock yards, stock trucks and carried around on footwear etc. is possible but less common than direct animal-to-animal spread.

The virus is quite fragile outside the animal, but in ideal circumstances it may be able to survive in the environment for a week. It has also been shown experimentally that the airborne spread of the virus can be up to 10 metres, so the virus can infect naïve cattle through and over neighbours' fences.



The cost of BVD Virus

As knowledge about BVD increases both in New Zealand and internationally, researchers and scientists have been able to estimate the cost of BVD in dairy herds.

In the calculation below, productivity losses due to BVD have been expressed for the average-sized New Zealand herd at a \$6.50 per kilogram of milk solids (kgMS) payout based on a New Zealand study involving 590 herds.

Lost production from BVD virus

Decline in milk production = 0.074kg/day

Increased interval from calving to conception = 2.35 days

Increase in abortion rate = 2.03%

Increase in induction rate = 0.33%

Statistics for an average New Zealand dairy herd

Average herd size = 386 cows

Dairy payout = \$6.50/kgMS (this can vary between seasons)

Average production per cow = 1.41kgMS per day

Average days in lactation = 260 days

Cost of cow replacement less payment for cull cow = \$1000

Value of 2-year-old = \$1200

Net value of weaner calf = \$100

Production losses in an actively infected BVD herd

Cows take 2.35 days longer to conceive

$2.35 \text{ days} \times 1.41 \text{ kgMS/day} \times \$6.50/\text{kgMS} \times 386 \text{ cows} = \8313

Cows produce 0.074kgMS less per day

$0.074 \text{ kgMS} \times 260 \text{ days of lactation} \times \$6.50/\text{kgMS} \times 386 \text{ cows}$
 $= \$48,273$

On average 2.03% cows will abort and be culled

$2.03\% \times 386 \text{ cows} \times \$1000 \text{ cost of replacement} = \7836

On average 2.03% cows will abort and lose their calf

$2.03\% \times 386 \text{ cows} \times \$100 \text{ net value of 100kg calf} = \784

On average 50% of PI cattle die before 2 years of age

$1.33\% \times 386 \text{ cows} \times 50\% \text{ mortality} \times \$1200 = \$3080$

Culling of PI cattle over 2 years of age

$1.33\% \times 386 \text{ cows} \times 50\% \text{ survival} \times 69\% \text{ extra cull rate} \times \1000
 $= \$1771$

Annual cost of BVD in an average infected New Zealand herd
= \$70,057

This figure does not include losses from the immune suppression effects that result in additional clinical and subclinical diseases (e.g. mastitis) or effects in young stock.

The major economic costs associated with BVD are reduced milk yield and the culling of unproductive stock. With the overall cost to the New Zealand dairy industry estimated to be \$132 million and with at least 15% of New Zealand dairy herds having active infections, it makes strong economic sense to eliminate BVD from the herd, and protect the herd from new BVD infection.

Key points on the cost of BVD

- BVD infection impacts economically on many areas of a dairy enterprise.
- Individually, these effects are usually too small to be noted by the farmer.
- Collectively, they add up to a significant cost to the farm.



BVD Control

Every dairy farm is unique, therefore there is no universal BVD control programme that 'fits' all farms.

It's highly recommended that a risk assessment analysis be carried out with a vet who has been trained in BVD management before a management plan is put in place, and that you work closely with this vet whilst implementing and monitoring the plan to ensure it has a successful outcome.

The control measures implemented must be practical and sustainable both financially and physically. They must also significantly reduce or limit the economic, animal health and welfare effects of BVD virus on the farm.

Setting up a BVD control programme on an individual dairy farm is a 4-step process

- 1 Define** BVD status of the dairy herd.
- 2 Assess** BVD biosecurity of the dairy herd.
- 3 Action** the most appropriate control plan for your farm.
- 4 Monitor** BVD status of the dairy herd regularly.

1

Define BVD status of the dairy herd

The purpose of this step is to determine if the herd is currently infected with BVD. This information has a bearing on the type of control plan that is subsequently devised for your farm.

To define a herd's BVD status, a bulk milk sample is collected for antibody testing. Your vet or LIC can organise this for you.

- A high level of antibody indicates the herd is either currently infected or has been infected recently.
- A low to moderate level of antibody indicates the herd is currently not infected with BVD virus and most likely hasn't been for a few years.

In herds with high bulk milk antibody levels you, in consultation with your vet, may wish to determine if any milking cows are PI. This can be done by requesting a special virus test on the bulk milk sample. This test is known as the PCR test.

For more detail on this step, refer to page 23.

2

Assess BVD biosecurity of the dairy herd

In this step, you and your vet determine how likely it is that BVD can come on to your farm and infect your cattle. In other words, how biosecure is your farm and your farming practices? The best way to determine this is to fill out a 'risk assessment' questionnaire (refer to the back cover). The questionnaire will identify areas of good biosecurity practice and areas that need addressing.

Becoming BVD biosecure involves setting up and implementing steps to limit the risk of the virus being introduced to and spreading on the farm. The three words **In**, **Out** and **Over** cover the key biosecurity areas.

In

Cattle coming on to the property, including their fetuses.

People coming on to the farm as well as any contaminated equipment and vehicles.

Out

Cattle going off the property and returning pregnant at a later date – e.g. heifers and carry-over cows grazing off the farm.

Over

Contact with neighbours' cattle across the boundary fences.

Once the biosecurity risks have been identified, it's time to develop an action plan for control.

3

Action the most appropriate course of control plan for your farm

The goal of the plan is to put steps in place to minimise the risk of early pregnant cows becoming infected with the virus, leading to the birth of PI calves. PI animals are the main source of infection and the main mechanism for maintaining infection within a herd. Removing any PI animals and preventing PI animals forming or entering the property is a major component of controlling BVD.

There are basically 3 types of action available to help prevent PI animals being born or entering the herd:

1. Test incoming animals (including bulls and calves born on the property) for the virus and cull any PI animals identified.
2. Vaccinate cows and heifers with a fetal protective vaccine to protect them during their pregnancy and vaccinate bulls used for mating.
3. Change management practices to reduce the risk of virus introduction or pregnant cow exposure. For example: put electric outriggers on boundary fences to limit nose-to-nose contact with neighbouring cattle.

For each of the risks identified by the risk assessment questionnaire, consider if one or more of these options is practical for your situation.

Let's use an example:

You send your heifer replacements out to graze, where they are mixed with other cattle of uncertain BVD status. If you do nothing, there is a risk that one or more of your heifers will produce a PI calf as a 2-year-old. To minimise this risk, what are your options? These include:

1. Test all keeper calves from these heifers for the virus prior to their leaving the rearing shed.
2. Vaccinate the heifers whilst out grazing, making sure they are fully protected during early pregnancy. Only vaccines with an approved label claim for fetal protection must be used.
3. Decide not to keep any calves from heifers, putting steps in place to make sure you don't keep any by mistake through misidentification (e.g. you may need to calve heifers in a separate mob).

Which one suits your farming system best? If you don't keep any heifers' calves (either as replacements or beef animals), option 3 may be the best for you. If you keep some heifers' calves, options 1 and 2 are the only options (or you may decide to do both a belt and braces approach). Note that option 2 is the only one that would also prevent pregnancy loss due to BVD infection.

Continue this action for all the risks that have been identified in the questionnaire. These risks are:

In

- Bulls.
- Brought-in cows.
- Fetuses from brought-in cows/heifers (these fetuses must be identified and tested after birth).
- Any other cattle brought on to the milking platform.
- Indirect contact through people and equipment coming on to the farm e.g. vets, scanners, AI technicians, transporters.

Out

- Heifers, carry-over cows or lease cows that go out to grazing and become pregnant off farm.
- Pregnant cows dried off early and sent away for grazing (e.g. due to a drought).

Over

- Early pregnant cows exposed to neighbours cattle over the boundary.

The final consideration in this plan is what to do with PI animals that are present on the farm in those herds that are currently infected. These PI animals may be in with the young stock or an adult herd or both. They are an obvious risk to any naïve cow on the farm and a plan needs to be put in place to deal with this risk. The best option(s) for your farm can only be worked out between you and your vet.

Once PI animals have been identified, culling is recommended.

4 Monitor progress

Once the control plan has been put in place it's very important to monitor progress for 2 reasons:

1. To identify whether control procedures are improving the infected herd's BVD status. In other words, is the plan working?
2. To detect as quickly as possible any new viral introduction in an uninfected herd to minimise the impacts on the herd.

There are 2 ways to monitor a herd's BVD status:

1. Do an annual bulk tank milk (BTM) antibody test, plus a BTM PCR test if needed.
2. Determine the virus status of the replacement calves.

There are benefits and limitations for each of these monitoring methods and the best approach for your farm needs to be worked out with your vet.



This section provides more detail about the first 3 steps to control BVD

Step 1: How to define BVD status of your dairy herd

Ask your vet or LIC to get a BTM antibody test.

- If the result (S/P ratio) is greater than 0.75, the herd is either currently infected or has been in the recent past.
- If the result (S/P ratio) is less than 0.75 the herd is virus free and has been for the past few years.

If the BTM antibody test shows an S/P ratio greater than 0.75, do a follow-up BTM PCR test to determine whether there are any PI cows in the herd. It will detect one PI cow in any-sized milking herd.

- Occasionally the PCR test will pick up a TI cow in the herd, so follow-up testing may be required as advised by your vet.
- A negative BVD PCR test on a BTM sample identifies those herds that do not currently have a PI milking cow, provided that all the milking cows contributed milk to the bulk tank that was sampled.
- All milking cows not contributing to the vat on the day of testing will need to be tested so the herd status can be accurately determined.

The BTM antibody test only measures the level of exposure of cows in the milking herd.

- Infected replacement stock are still possible with a low S/P ratio, so it's best practice to screen both age groups of replacement stock as well by using either a blood or an ear notch skin sample to check for the presence of BVD virus.
- There are different tests available depending on age and the number of animals to be tested. Your vet will advise you on the best option.

Step 2: Assess your biosecurity.

Quick risk assessment for BVD virus introduction in dairy herds

- 1** **In** Do any untested or pregnant animals (either tested or not) ever come on to the property (e.g. cows, heifers, calves, bulls, freezer beasts)?

Yes No

- 2** **Out** Are any heifers, cows or carry-over cows away from the home farm during pregnancy?

Yes No

- 3** **Over** Is contact possible between your cows and cattle from other farms, such as a neighbour's?

Yes No

- 4** Do you vaccinate for BVD?

Yes No

If yes, which age group(s)?

If any of questions 1, 2 or 3 are answered yes, this herd is at risk of introducing BVD virus if steps are not taken to mitigate this risk.

Discuss a BVD management plan with your vet.

Step 3: Action the most appropriate course of control for your farm

The following table is a summary of the actions available to deal with the risks to a herd posed by the main sources of BVD virus. Options for control are broken down into:

Test and cull, which involves looking for PI animals in the target group listed and culling any found.

Vaccination of the target group listed to protect these animals from the effects of BVD if biosecurity cannot be guaranteed.

Management options that reduce or prevent exposure.

A single option may be sufficient on its own, or best used alongside other options for a given source of risk.

This protocol is focused on preventing the creation of PI fetuses. Although some control measures will not control some costs associated with transient infections, the primary aim is to prevent long-term infection of the herd, especially during the period when cows are less than 4 months pregnant. The vaccination option requires that the vaccine used must have an approved label claim for fetal protection.

Options available to mitigate the risks of BVD entry on to your farm

Risks to herd	Test and cull	Vaccinate	Management
Bulls			
Brought-in cows			
Neighbours			
Calves A. From heifers B. From cows away in first 4 months of pregnancy C. Born from pregnant brought-in cows			
People (vets, scanners, AI, embryo transfer, transporters)			

Dealing with bulls that are used during mating

Test and vaccinate bulls

It should be farm policy that all breeding bulls are tested for BVD virus (this is a single lifetime test), and if negative, vaccinated (twice, 4 weeks apart initially, then annually).

A PI bull can have a serious impact on reproductive performance in 3 ways:

1. **Non-venereal spread of the virus to other bulls and cows.**
2. **Venereal spread of the virus in the semen.**
3. **Poor semen quality.**

In particular, the introduction of a PI bull to a naïve herd at mating may have a devastating effect on herd fertility and result in a large number of PI calves.

Testing for the virus

All untested bulls that are going to be used for breeding need to be tested for BVD virus by using either a blood or a skin test. Blood samples from a large number of bulls can be tested using the pooled BVD PCR virus test to reduce cost. Discuss the best option with your vet.

A positive test result usually means the bull is a PI. Occasionally it may be a TI. A follow-up positive virus test result from a blood sample collected 3-4 weeks later will confirm that the bull is a PI and must be culled. A follow-up negative virus test result 3-4 weeks later will confirm that the bull was TI and may be suitable for breeding.

However, the BVD virus infection may cause poor semen quality resulting in poor fertility. As the semen production cycle is about 8 weeks, a TI bull may not be suitable for breeding in that season.

Vaccinating bulls

BVD virus negative bulls must be vaccinated prior to mating to prevent transient infections and immune suppression. A transient infection can result when an unvaccinated BVD virus negative bull is exposed to the virus either before or after being joined with heifers or cows at mating.

It is best practice for bulls to be vaccinated when they are tested to limit the risk of BVD virus negative bulls becoming a TI. Vaccination should be completed at least 2 months before use so that the bull cannot become a TI within 8 weeks of mating and affect semen quality.

Previously unvaccinated bulls require **2 vaccinations** 3-4 weeks apart followed by a single **booster** at least 2 weeks prior to mating every year after that. (Refer to the manufacturer's recommendations.)

Vaccination will not have any effect on a PI bull, so testing is essential.

Certification

Bulls should be certified BVD virus negative and vaccinated as best practice.

When purchasing bulls it's recommended that a signed official certificate be sighted as proof that the bulls are virus negative and have been vaccinated twice 3-4 weeks apart. If not, the purchaser will need to get the bulls tested and vaccinated before use.

Herd vaccination as a means of control

A well managed and implemented vaccination programme is likely to reduce viral transmission and the consequent production of PI calves in BVD-infected dairy herds. It will also limit the economic and animal health impacts of viral introduction to BVD virus free herds.

For vaccination to be useful as part of a BVD control protocol, it must provide protection of the fetus and therefore prevent PI animals being born. In order to achieve this:

1. To ensure fetal protection is provided during the first 4 months of pregnancy, the vaccine must be administered at the correct time. Refer to the vaccine manufacturer's recommendations for this information.
2. Only vaccines with an approved label claim for fetal protection must be used.
3. The date of vaccination and the identification of all animals that have been vaccinated should be recorded on a farm database (e.g. Mindapro).



Integrating vaccination into a BVD control programme

When developing a BVD control programme on a farm, there may be a group of cattle where the risk of exposure cannot be minimised. If this is the case, then vaccination of a specific group of cattle on the farm may be a valid strategy to counteract this exposure risk.

Any cattle that go off the farm and return pregnant should be fully vaccinated with a fetal protective vaccine if there is a chance they could become exposed to BVD virus during pregnancy. Timing of vaccination is dependant on the planned start of mating date.

Situations where this is often the case include:

1. Heifers and/or carry-over cows that go off-farm to graze. These animals may be mixed or be next door to cattle of unknown status. Full vaccination of this group prior to these animals leaving the farm and again 12 months later will protect them from any health effects or growth suppression from transient BVD infection. Vaccination prior to mating will also protect these animals from impaired reproductive effects during mating and pregnancy and minimise the chance of PI calves being brought back to the milking platform.
2. Cattle going to shows or being leased out for a period, especially if in the first half of pregnancy.
3. Consider vaccinating introduced cattle that are naïve or of unknown status coming on to a known infected farm. This most commonly occurs with rising 2-year-old cattle returning home from grazing where the dairy farm is known to be infected. It also applies to bulls coming on to an infected property.

Using vaccination as the only control strategy

In some situations, annual vaccination of the whole herd may be a consideration as a way to control BVD on a farm. However, this should only be implemented after other means of control have been examined and eliminated based on cost/practicality, sustainability etc.

Once a decision to fully vaccinate a herd has been made, the vaccination programme needs to be well managed and conscientiously implemented to achieve the best possible outcome.

Before implementing a vaccination programme in your herd, discuss the options as part of the overall BVD control programme with your vet.



Quick risk assessment for BVD virus introduction in dairy herds

Name

Date

Address

Vet

Herd Code Dairy No.

Milking Herd Size

1 **In** **Do any untested or pregnant animals (either tested or not) ever come on to the property (e.g. cows, heifers, calves, bulls, freezer beasts)?**

Yes No

2 **Out** **Are any heifers, cows or carry-over cows away from the home farm during pregnancy?**

Yes No

3 **Over** **Is contact possible between your cows and cattle from other farms, such as a neighbour's?**

Yes No

4 **Do you vaccinate for BVD?**

Yes No

If yes, which age group(s)?

If any of questions 1, 2 or 3 are answered yes, this herd is at risk of introducing BVD virus if steps are not taken to mitigate this risk. Discuss a BVD management plan with your vet.

BVD

BVD STEERING COMMITTEE

Working to free New Zealand cattle farms from BVD

Produced in partnership with



MSD

Animal Health