The Scottish Government
Riaghaltas na h-Alba

VETS' GUIDE TO:

Enhanced BVD Screening

BVD Eradication Scheme Phase 4

The Scottish BVD Eradication Scheme:

A Guide to Enhanced Annual Screening for Vets in Practice

June 2015

This guidance has been created to help you advise cattle keepers on how they can meet the requirements of the law in relation to BVD. The Scottish Government has produced this guidance with content and advice from George Caldow of SAC, Peter Nettleton, and partners from the livestock industry, veterinary profession and scientific bodies.

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PART 1

INTRODUCTION

This booklet is an updated practical guide for vets in practice on animal restrictions and mandatory testing under the Scottish BVD eradication scheme. It outlines the new legislation, provides advice on the testing methods and explains what to do with samples.

Most herds in Scotland are free of BVD – we estimate no more than a fifth of holdings have an active BVD virus infection in any one year. Removing BVD from those remaining herds would be worth thousands of pounds to most of them each year, and millions of pounds to the Scottish cattle sector.

BVD eradication is achievable in almost all herds in less than two years. The risk of re-infection through contact with infected animals remains, but by eradicating BVD at the national level, everyone benefits through minimising these risks.

Separate guidance for farmers has been sent to all cattle keepers and can be found on the Scottish Government website at www.gov.scot/bvd. Copies have also been sent to all livestock veterinary practices.

PART 2

THE SCOTTISH BVD ERADICATION SCHEME

Key features of new legislation (phase 4)

- Any animal from a herd with a 'not negative' BVD status will not be able to move unless individually tested negative for BVD virus or moving directly to slaughter.
- Animals brought into a herd from an untested herd will have to be individually tested for BVD virus. This will include imported animals along with any from non-breeding herds.
- A reduction in the number of testing options available to three for 'negative' herds and two for 'not negative' herds. This will see the removal of all bulk milk tests and the introduction of a new dairy check test.
- Assumed status – The calf of a PI mother will be assumed to be PI and the mother of a BVD virus negative animal will be assumed to be BVD virus negative.

Continuing Measures

- Every keeper of a breeding cattle herd must continue to screen their herd annually.
- Animals identified as positive for BVD virus cannot move other than directly to slaughter.
- Screening samples must be sent to an approved laboratory along with the required information.
- The laboratory should declare a herd status as **'negative'** or **'not negative'**, depending on the outcome of testing. Laboratories must inform the Scottish Government of all BVD test results whether for an official screening test or not.
- The laboratory must also inform the keeper of BVD test results.

Not negative herds

The purpose of the BVD eradication programme is to identify and remove Persistently Infected (PI) animals from the national herd. 'Not negative' herds have evidence of exposure to the disease, therefore more thorough testing is required to identify if there are PI animals present. If a keeper has a 'not negative' status they should use either a calf screen or a whole herd screen as their annual test. Only animals that have tested negative for BVD virus or those assumed to be negative can move from 'not negative' herds.

Restrictions on bovine animals from untested herds

If a keeper brings an animal into a breeding herd from an untested herd, be that a non-breeding herd or it is an imported animal, the animal must tested for BVD virus on arrival. The status of the receiving herd will change to 'not negative' until a negative test result has been received for the animal. The brought in animals should be isolated from the rest of the herd until the result has been received.

Untested herds

If a keeper does not test annually their herd will be given a status of 'not negative' and the restrictions for 'not negative' herds will apply.

Mandatory screening for breeding herds

Keepers of breeding herds of cattle in Scotland must continue to have their herds screened every year for BVD.

What is a breeding herd for the purposes of the legislation?

A herd is defined in the BVD Order 2013 as a breeding herd if breeding is planned or allowed to happen. There is no set number of births or cattle that are needed to constitute a breeding herd – one cow used for breeding is enough.

How must they be screened?

Three minimum testing methods are now available, and these are set out in full in Part 3. These are the minimum requirements; it will often be in your clients' interests to do more than this and we recommend that you advise appropriate follow-up testing in a herd with a 'not negative' status in order to identify any PI animals that may be in the herd.

Non-breeding herds

For any other type of cattle herd, such as a finishing herd, any calves born are required to be tested for BVD virus within **40 days of birth**. This would usually be by tissue test but the laboratory would be able to tell you from what age they would accept a blood sample.

Assumed status

Animals which have been individually tested for the BVD virus will have a result of either positive or negative.

If they are negative, these animals are able to move because a negative animal can **never** become PI.

Phase 4 will introduce an assumed status for some animals. The mothers of any individually negative animals are also safe to move. A PI mother cannot give birth to a virus negative calf and therefore if a **calf is BVD virus negative its mother will have an assumed individual status of BVD virus negative.** If you have to individually test animals to move them, where a calf has a negative result, the mother will be given an assumed negative result and can also move.

If the result is positive the animal is a suspect PI, it cannot move other than directly to slaughter. A PI mother can only give birth to a PI calf and therefore **any calf born to a PI cow will be assumed to be PI** and cannot move other than directly to slaughter. You should retest any positive animal after three weeks to ensure that the animal was not suffering from a transient infection.

Persistently infected (PI) animals

Any animal that tests positive for BVD virus will be identified in the database as virus positive and will be assumed to be PI until a subsequent test can show that the infection has been transient. To ensure that an animal is not transiently infected it should be retested after three weeks. If on the second test the animal is virus negative it may move again.

PI animals are only permitted to be moved off the farm if going directly to slaughter. In exceptional circumstances, such as for immediate welfare issues, a veterinary inspector may allow an infected animal to move under licence through applying to the Animal and Plant Health Agency (APHA).

BVD virus infected animals may not pass through a market or any other holding. The Scottish Government will be informed by the laboratories each time an animal tests positive for BVD virus, and will know through movement records if a virus positive animal is moved to another holding.

The BVD look up and herd declarations

The ScotEID website at www.scoteid.com is the central point at which all BVD results can be found. All approved laboratories report their results directly to the ScotEID database. You can find the status of any herd and the result of any individual animal tested if you have the County Parish Holding (CPH) and individual animal number. Help on how to use the BVD lookup facility is provided on the ScotEID website or through the BVD helpline on 0300 244 9823.

You should contact the helpline to register with ScotEID. Registering with ScotEID will allow you to:

- See all of the BVD results for your clients.
- Search for a specific CPH or animal ID.
- See a list of all calves born and all current cattle on the holding and whether these have been tested.
- See clients' renewal dates and status.
- All tissue test results (where your client has provided a vet postcode).

This will give you the ability to change a herd status where appropriate and identify what further testing may be required.

In phase 4 mandatory herd declarations are not required as animals should not move from a 'not negative' herd unless they have been individually tested for the virus. However, farmers should continue to use the BVD lookup to ensure any animals that are to be purchased are from negative herds or have had a negative virus test. If animals are purchased from a 'not negative' holding the receiving holdings status could be affected.

PART 3

MINIMUM TESTING METHODS

This part of the guidance explains which testing methods may be used to screen for BVD.

There are several testing methods that allow flexibility in screening the different herd types, from crofting to large commercial breeders.

You should work with your clients to ensure the most appropriate testing method is chosen for their circumstances.

Many of the methods for screening herds are based on the Cattle Health Certification Standards (CHeCS) (www.checs.co.uk), though they do not precisely reflect them. This means that most of those in CHeCS schemes will normally not need to do anything more than fulfil the requirements of their health scheme.

All breeding herds must be tested using one of the following three methods.

0. NEW – The dairy check-test – for year-round calving 'negative' herds

The standard check test is appropriate for herds that have distinct block calving periods. In dairy herds that calve all year round it can be difficult to ensure that the heifer groups are surveyed properly. To ensure that exposure is detected in these herds more animals must be sampled more frequently. The following sampling frame addresses this important difference. It remains important to ensure that each successive group of heifers is sampled. Blood sample no less than **10 animals** between the age of **9-18 months** per separate group twice per year (no more than a seven month interval between test dates). Sampling the five oldest and five youngest within this age frame in each group should be carried out whilst ensuring that animals are sampled before they are vaccinated.

The number **0** has been allocated for the dairy test on sample submission forms in order that the database can recognise that the dairy check-test has been used.

1. Sampling calves – the check-test (antibody) – for block calving 'negative' herds only

This is used in herds that are negative. It relies on the principle that where any group of calves has been together for more than two months and a PI is present in the group then the majority of animals in that group will have been exposed to BVD infection and be positive for antibody to BVD. This allows a relatively small number of animals from the group to constitute the sample for the check-test.

It requires all groups from all calving blocks in any one year to be sampled. The visit or visits should be scheduled to ensure that the groups are in the target age range of nine to eighteen months.

Where the majority of calves are sold off the farm before they are nine months, as occurs in many hill and upland beef cow herds, then sampling of calves in the age range of six to nine months is permitted, but the sample size should be increased as advised.

If all the samples are negative, this will constitute a negative result for that year. More guidance on the effective use of the check-test can be found in the online CPD. Where there are a very small number of calves in a herd or group, and they all test negative for antibodies, you may wish to consider asking the testing laboratory to test one sample for BVD virus as they may all be PI calves.

If animals are vaccinated against BVD before the samples for the check-test are collected then the check-test may fail, which may result in a 'not negative' status for your client's herd. Where possible only test unvaccinated animals for a check-test. BVD vaccines differ in their ability to stimulate antibody against BVD that is detected by the screening tests used. Where a modified live vaccine is used all vaccinated calves are likely to test positive for antibody to BVD. Furthermore maternally derived antibody is likely to persist for longer and calves younger than nine months of age are more likely to test positive for antibody. Therefore if animals have been vaccinated by the time they are sampled, please ensure that their vaccination dates and vaccine name are provided to the laboratory.

Each separate group of cattle must be identified and sampled, otherwise the test may fail to detect infection when it is present – see Part 4 for more advice. Failure to survey all the groups effectively results in increased risk of missing the presence of a PI animal and delays the opportunity for you to prevent further losses in your clients' herds. You should speak to your client before cattle are selected for sampling to ensure that all groups have been identified.

Low or inconclusive levels of antibody in one or two animals in a group will require careful interpretation. In these circumstances, the herd's vet, after consultation with the laboratory, may be justified in changing the herd's status from 'not negative' to 'negative'. Assistance with interpretation can be found on the BVD CPD course (www.gov.scot/bvd). Vets who have successfully completed the CPD course can sanction such changes in a herd's BVD status.

(a) Five calves aged 9-18 months

Take samples of blood from not less than five calves in the age range 9 to 18 months in each group (see p.18 for more information). If there are less than five animals in this age range you should advise if this test is still appropriate or whether a different testing option would be preferable. This judgement will be based on the evidence you are presented with and your professional judgement.

(b) 10 calves aged 6-18 months

This option is appropriate where the majority of calves are sold off the farm before nine months of age. No fewer than ten calves should be sampled in each group. Note that if this option is used in herds that have used the modified live BVD vaccine then the check-test is likely to fail and result in a not negative status.

Shetland only: in recognition of the successful eradication of BVD from Shetland, you may take blood from not less than five animals in the age range 6-18 months. If there are less than five animals in this age range you should advise if this test is appropriate or if a different testing option would be preferable.

(c) Five homebred animals over 18 months

If there are fewer than 10 calves aged 6-18 months, then and only then, you may choose to use the following method: take a sample of blood from not less than five animals **over 18 months** that have been on the **holding since birth** in each group. If there are less than five animals in this age range then another test such as full herd screen for antigen may be more appropriate.

2. Test all calves for BVD virus

Individually test all calves born in the herd within the year for BVD virus by blood or tissue sample. Calves can be tested as they are born, or all at once later in the year. Testing at birth has the advantage that PI calves can be identified and removed before the breeding season begins.

If all the calves are negative for BVD virus this will constitute a negative result for the year.

3. Test all animals for BVD virus

Individually test all animals in the herd at one time for BVD virus by blood or tissue sample, regardless of age and including bulls. The youngest age at which calves are old enough to be blood tested will be advised by the testing laboratory; this is usually one month. If all the animals are negative for BVD virus (BVDV), this will constitute a negative result for that year. This may suit herds where BVDV infection is suspected of herds where no other method is suitable. With assumed status for this screening test you now only need to test all calves and all animals that do not have calves as the mother will achieve an assumed status from its calf.

Where possible, for options 2 and 3 samples and any retest required should be sent to one laboratory only. Where samples have been sent to more than one laboratory it is difficult for them to allocate a herd status and you may be asked to help your client with this.

Removal of the bulk milk tank antibody test

Analysis of results so far has shown that for 12% of beef herds the most recent test result is 'not negative'. For dairy herds this is far greater at around 40%. The bulk milk antibody tests can detect historic infection and/or vaccinal antibodies. It is important that we establish the true level of infection within dairy herds and that PI animals are identified and removed. The bulk milk tank antibody tests were useful for initial screening in the early part of the eradication scheme, but as the scheme progresses we need to know if there is active infection within the herd. On consultation with the industry and scientists, it has been decided to remove the bulk milk antibody testing options from the eradication scheme, however these tests can still provide useful information.

Testing options summary table

No.	TESTING OPTION	DAIRY/ BEEF	TEST FOR ANTIBODY or ANTIGEN/VIRUS
0	Dairy year-round calving – 10 animals per management group twice per year	Dairy	Antibody
1a	5 animals between 9-18 months per separately managed group	Block calving dairy or beef	Antibody
1b	10 animals between 6-18 months per separately managed group Shetland only – test five animals from this range	Mostly beef	Antibody
1c	If neither above are possible 5 animals 18m+ on holding since birth per separately managed group	Mostly beef	Antibody
2	All calves	Either	Antigen/Virus
3	All animals	Either	Antigen/Virus

TESTS AVAILABLE

There are a variety of testing options available to detect BVD, some of which are used in mandatory annual screening and others which may be used for follow-up testing.

Blood may be used for antibody or virus testing. Tissue and milk samples can be used for virus testing.

Maternally derived antibody results in a diagnostic gap for the detection of BVD virus in blood samples from young animals. The duration of the gap is related to the test and the testing system. You should consult with your laboratory regarding what age the calves should be tested for the testing system that is to be used.

There is not considered to be a diagnostic gap where tissue samples are used as the sample for virus detection.

Milk may be tested for BVD virus but only by the polymerase chain reaction (PCR).

Tests for BVDV antibody

Antibody detection ELISA

Antibody detection ELISAs are accurate and suited to high-throughput testing. They are available in a variety of formats so that results are given in different ways, which can be confusing. Labs will provide interpretation and explanatory notes specific to the test that has been used. Not all samples are clearly negative or positive. Those with readings around the negative/positive cut-off value may be classified as inconclusive. The Scottish Government scheme has had to accommodate the inconclusive results and has included them with positive results to classify a group as ‘not negative’. A ‘negative’ group contains only animals with no BVD antibody. Where an inconclusive result or missing sample is reported from the laboratory a replacement sample which tests ‘negative’ will need to be provided in order to achieve a ‘negative’ herd status.

Other tests for BVD antibody

Other tests for BVD antibody (eg serum neutralisation test (SNT)) are available and may be used occasionally to resolve unusual ELISA results.

Tests for BVD virus

BVD antigen detection ELISA and PCR for BVD virus

Samples will be reported as negative or positive for the presence of BVD virus. Only rarely will a sample be classed as inconclusive necessitating a retest.

An animal that tests positive for the BVD virus will usually be PI, but it is recommended that to confirm an animal as PI it should be sampled for a second time after at least three weeks. True PI animals will be virus positive in both tests. Any animal undergoing an acute transient infection at the first test will be virus negative and antibody positive at the second test. A PI should test antibody negative.

Any PI animal that has been vaccinated against BVD continues to shed high levels of infectious virus and is unlikely to produce enough antibody in response to vaccination to block the detection of the virus in the blood.

The BVD PCR can also be used to detect virus in bulk milk and can be used to detect the presence of a single PI animal in a herd of up to 300 cows.

The PCR test is also sufficiently sensitive to be used in other pooling systems with both blood and tissue, but you should discuss any age restrictions that apply to calves when blood samples are used with your test provider.

Who can take samples?

	Veterinary surgeon	Veterinary nurse	Milk recorder	Milk collector	Keeper
Blood	✓				
Ear tissue tag	✓	✓			✓
Individual milk	✓	✓	✓		
Bulk milk	✓	✓	✓	✓	

Who can test samples?

For any of the mandatory screening tests, samples must be tested by a laboratory approved by the Scottish Government. Part 5 below gives more details. A list of approved laboratories is available at www.gov.scot/bvd.

Who determines the herd status?

The laboratory should determine the herd status, based on the results of the samples submitted and the information provided with the sample submission forms.

At the date of publication eight laboratories are approved for testing for the BVD eradication scheme. For up to date information and contact details for laboratories please consult the website www.gov.scot/bvd

Can a herd status be changed?

Yes – a veterinary surgeon can change a herd status for a client from not negative to negative, subject to certain conditions – see Part 7 for more details.

PART 4

WHAT CONSTITUTES A SEPARATE GROUP

The effectiveness of the check-test depends on the correct identification of each separate group of youngstock. A separate group consists of those animals that can freely achieve nose-to-nose contact with all others within the group.

For example, in most beef herds the minimum number of animals to sample will be five from the heifer group, five from the bull or steer group and where there are spring and autumn calving blocks care should be taken to include groups of calves from each block. To achieve this more than one sampling visit may be required in some herds.

The point of testing separate groups is to show if there is a PI animal within the herd, and where it is. PI animals spread the virus very efficiently when in close contact with other cattle. Nasal discharges and saliva are the most potent sources of infectious virus so that any husbandry system which permits nose-to-nose contact will hasten the spread of virus from PI cattle to susceptible animals. Intensive housing with trough feeding will ensure rapid spread whereas spread will be slower among cattle at grass.

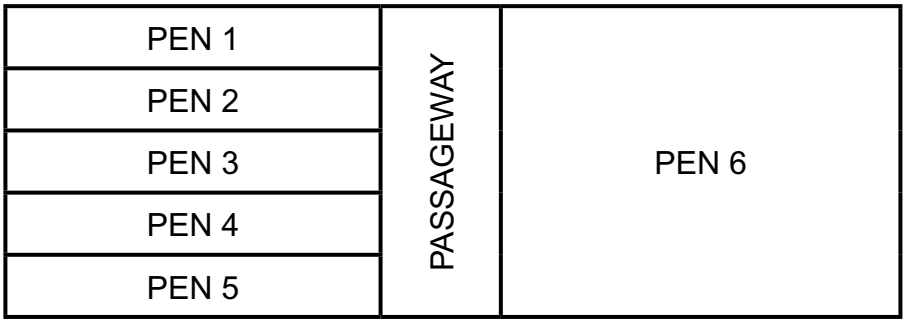
Because of the efficient spread it is not necessary to bleed the whole group. A sample of animals is sufficient providing the following conditions are met:

- All the animals in the group have been together for at least two months.
- They will have had nose-to-nose contact during that period.
- They are in the appropriate age range (see testing options described previously).

The second point above is important when deciding about housed animals. Animals either side of a central passageway for example are separately managed groups.

It is not always necessary to test every pen in a shed. Consider the layout of a shed shown in the diagram below:

Diagram 1



In the example above, cattle in each pen have nose-to-nose contact with cattle in adjoining pens. This means that a PI animal in any pen is likely to cause transient infection in any directly neighbouring pen. So, provided the groups in the diagram above have been together for more than two months, taking a sample of five calves aged 9-18 months from **Pen 2**, **Pen 4** and **Pen 6** will be sufficient. This is because enough calves in Pen 1, Pen 3 and Pen 5 would be infected by a PI calf in a neighbouring pen.

Careful consideration should be given to the degree of separation between groups. For instance, in the example on the previous page, if there were walls between the pens, this could prevent sufficient nose-to-nose contact from occurring.

In extensive systems, where cattle are spread over a wide area, consideration should be given to ensuring that the cattle have had sufficient opportunity to spread virus within each group before sampling.

SUBMISSION OF SAMPLES

For mandatory annual screening, all samples must be sent to an **approved laboratory**. A list of approved laboratories is available on the website: www.gov.scot/bvd

An appropriate history should be given on the sample submission form. It is essential to include any BVD vaccination history to allow accurate interpretation of the results.

A common submission form has been created for all the approved laboratories – this is available from the laboratory and on the Scottish Government BVD website, as above. The laboratory needs to receive the following:

1. The keeper's name, address and postcode.
2. The CPH number for the holding on which the herd is kept.
3. The CPH number for the holding on which the animals are registered if different to where they are kept.
4. The vet name, address and postcode.
5. The date samples were taken.
6. Which testing method (see Part 3) was chosen.
7. Whether samples are to be tested for the presence of BVD virus or evidence of antibody to BVD virus.
8. The **full 14 character** official ear tag numbers for all the animals from which the samples derive.
9. The number of breeding females in the herd.
10. The number of calving periods.

PART 6

HERD STATUS DECLARED – WHAT NEXT?

The laboratory should inform the keeper of the herd status, and you may want to be able to advise your clients of what they should do next. This section gives you some guidance on what should be done whether the status is negative or not negative.

You should always advise clients to send PI cattle straight to slaughter

Herd which has a negative herd status for BVD

A negative status is something your client should try to protect.

Though a negative herd status is good news for your client, on its own it is not as good a standard as a CHeCS-approved BVD-free status. It is also only a snapshot – risks of disease incursion remain and need to be considered.

You may wish to discuss biosecurity with your client. This is a good time to create or review a biosecurity plan, vaccination programme and a schedule for future surveillance sampling. You could also agree the actions to take should any incident of disease or breeding failure occur that could be attributable to BVD infection.

Herd which has a not negative herd status

From June 2015 there will be consequences to having a 'not negative' status. For this reason keepers with 'not negative' herds may seek your advice on how they can become 'negative'. To become 'negative' they will have to take steps to discover if they have any PI cattle and, if so, remove them. To do this they will have to carry out more testing.

There are several different ways to conduct follow-up testing. You may find the following advice helpful in deciding on a follow-up testing strategy.

Conducting Follow-Up Testing

Controlling BVD entails identifying and removing PI cattle and ensuring no more are born on or brought to the farm. Any control programme requires considerable thought and a substantial commitment. It should be clearly defined, realistic, constantly reviewed and sustainable. The vet CPD module includes flow diagrams for BVD eradication. Possible control and eradication procedures can be summarised as follows:

Beef Herd

- All bulls and immature cattle i.e. in-calf heifers, youngstock and calves (usually older than one month) and any cow that is not the mother of an animal being tested are individually blood tested for BVD virus. Continue testing for virus all calves born into the herd for 12 months following the removal of the last PI animal.

- After the calf crop has been screened individually, dams of calves which are not PI do not need to be tested. Ensure breeding females which have not had a calf tested or have given birth to a PI calf are individually tested for BVD virus.

- Calves can be tested for BVD virus when they are ear-tagged shortly after birth using tags that collect a tissue sample. This method has the advantage that PI calves can be identified and removed before the start of the breeding season.

Dairy Herd

- The milking herd can be screened for the presence of a PI animal by testing a bulk milk sample from up to 300 cows for BVD virus by RT-PCR. If the herd is too big or if a bulk milk sample tests positive, smaller pools and then individual milk or blood samples will have to be tested to identify the virus positive animal(s). Remember that in individual milk sampling, there is always a risk of cross-contamination which should be considered when analysing results. If a PI is indicated from this milk screen, further testing will be required on the animals contributing to identify it. Note that bulk milk PCR cannot be used as part of testing option 3 (all animal screen). Individual testing is required for this.

- All other animals i.e. dry cows, bulls, in-calf heifers, youngstock and calves (usually from one month of age) are individually blood tested for BVD virus. Continue testing for virus all calves born into the herd for 12 months following the removal of the last PI animal. Calves can be tested for BVD virus when they are ear-tagged shortly after birth using tags that collect a tissue sample. This method has the advantage that PI calves can be identified and removed before spreading infection.

CHANGING A HERD STATUS

Where your client is given a not-negative herd status, you may, subject to certain conditions, be able to change the status to negative.

A veterinary surgeon may only change herd results if they have successfully completed the Scottish Government online training course. This course is available via the Scottish Government website at www.gov.scot/bvd. It takes up to two hours to complete, and you will be sent a certificate following completion. The course is free of charge for veterinary practitioners with a client who has a herd subject to mandatory annual screening.

To change a herd status, you must notify ScotEID by calling the BVD helpline on 0300 244 9823.

When changing a herd status, you must declare the following:

A. For follow-up testing.

- "I have conducted appropriate follow-up testing and no persistently infected cattle have been identified on the holding."

B. On the removal of a PI

You can only change the herd status following the removal of a PI animal in one of the following circumstances:

1. The PI was a brought in animal and has been kept isolated from the rest of the herd.

2. The following generation of calves has been born and no PIs have been found i.e. there were no unborn PIs on the holding.

3. 12 months have elapsed since the PI was removed.

Under one of these circumstances only you may declare:

- "I have conducted appropriate follow-up testing and identified PI cattle. The keeper has informed me that they have been removed from the herd."

With this type of declaration you must provide the official ear tag identity numbers of any infected animals you have identified.

You do not need to check if PI cattle have been removed – you only need to have been told by the keeper that they have been removed. The Scottish Government will check that they have been removed.

C. The final situation in which you can change a herd status is where samples have been sent to more than one laboratory or where veterinary interpretation is required you will be able to change a herd status to 'negative' providing that all the required testing has taken place. To enable you to do this you must have registered with the database in order to have access to your clients results and the details of which cattle are on their holding. Under these circumstances you may declare that:

- "I have checked my clients results and I am confident that they constitute the full requirements for a 'negative' status following a year or more of testing."

BASIC FACTS ABOUT BVD

This section contains veterinary information on BVD. This has been produced by SAC, and is included in the online CPD (www.gov.scot/bvd). There is also great deal of useful information including videos, presentations and podcasts on BVD on the Royal Veterinary College's website at: www.rvc.ac.uk/bvd.

BVDV is closely related to border disease virus (BDV) of sheep and to classical swine fever virus (CSFV). The three viruses are grouped together as pestiviruses. Pestiviruses do not infect humans.

BVDV can infect goats, sheep, South American camelids and pigs. There is serological evidence of infection in wild ruminants in Scotland and beyond. Furthermore, the pestivirus of sheep, BDV, can infect cattle and result in the generation of persistently infected cattle. In Scotland the close contact between sheep and cattle that occurs on many farms creates the opportunity for BVDV to infect sheep and BDV to infect cattle and while the frequency with which this occurs is unknown, it has been considered unlikely to be of significance in relation to national control. To mitigate this potential risk breeding cattle should not graze in the same field as sheep except in the extensive hill situation.

Persistent infection (PI) with BVDV is the mechanism that allows this virus to spread and persist within a population of cattle. The PI animal is a potent source of infection releasing the virus in secretions from the respiratory, digestive and reproductive tracts. The generation of PI animals can only occur where infection of the dam occurred some time during the first trimester, crossed the placenta and infected the conceptus prior to the onset of the development of its immune system.

Transient infection can have a significant negative impact on the fertility of naive cattle, but transiently infected animals are much less infectious to others than PI cattle. In bulls infected transiently the virus can be released in the semen for a limited time. In all but a few exceptional cases this is only for a short period of time, but the semen of some bulls remains infectious while the bull itself is no longer infected.

Transient infection also has a prolonged impact on an animal's ability to resist the normal diseases of calfhood and it is this immunosuppressive effect that is considered to be of greatest financial significance to the cattle industry.

Vaccination

Vaccination on its own will not eradicate BVD from a herd or from the country. However, vaccination is and will continue to be an important tool in disease control for many, if not most, herds. BVDV vaccination is designed to protect dams in early pregnancy to avoid the production of PI cattle. Vaccination is also useful to protect susceptible cattle before they go through a mart. A decision on whether, what and when to vaccinate is one to be taken by the vet and keeper together. In considering whether to vaccinate you should consider the BVD infection risk factors for the herd involved, such as:

- Are there neighbouring holdings with cattle?
- Is there nose-to-nose contact with neighbouring cattle?
- Does the keeper buy-in cattle or is it a closed herd?
- Are bought-in cattle of known BVD status?
- Are cattle sent to shows?
- Are bulls brought in for breeding, and is their BVD status known?

The vaccines available are very effective, but care must be taken to ensure that the datasheet is followed precisely. This means storing the vaccine correctly and using the right doses, at the right time for that vaccine, including boosters.

Consideration should be given to scheduling check-test sampling and vaccination to ensure that vaccination does not lead to a failure in the check-test.

PI animals shed huge amounts of virus and present a significant challenge even to vaccinated animals. Inadequately vaccinated animals in contact with PI cattle are at significant risk.

Biosecurity

Farmers can reduce the risk of buying in cattle infected with BVD if they recognise the BVD status of cattle being offered for sale. They need to know the BVD status of the seller's herd plus any tests done on the animal being sold. Buying pregnant cattle is always risky since the BVD status of the calf is unknown and can only be tested when it is born.

Summary of Key Points

- PI calves are the most significant source of infection
- Transiently infected animals are much less infectious
- Most PI animals die before two years old, but some live much longer
- Biosecurity for added animals and at farm boundaries must be in the herd health plan
- Biosecurity should encompass personnel and equipment

PART 9

CURRENT BVD SITUATION

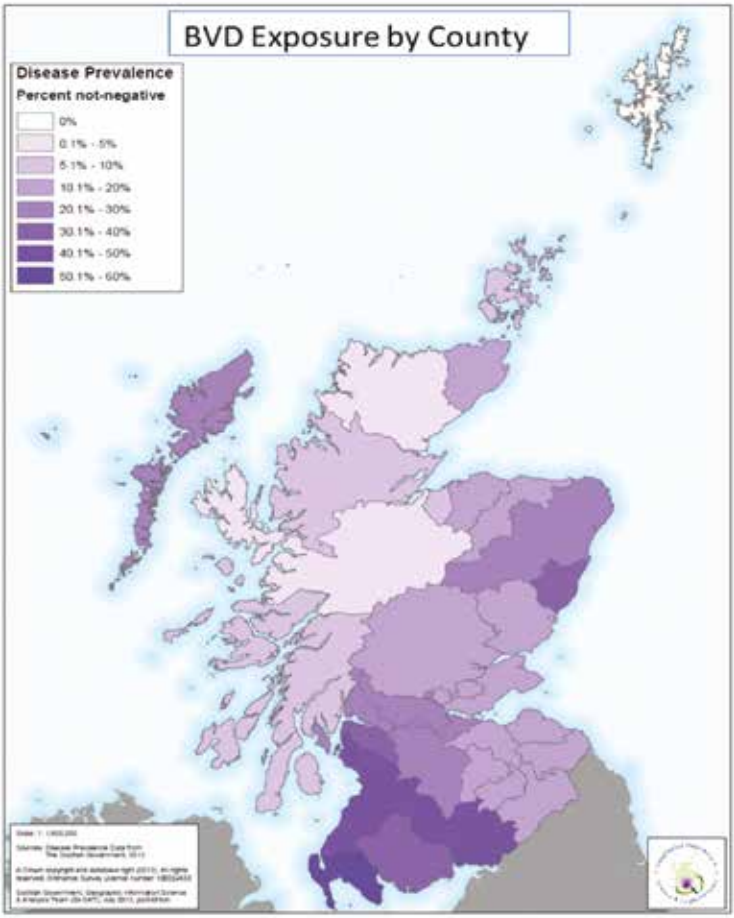
What is the prevalence of BVD?

Original SAC surveys prior to the eradication scheme estimated BVD exposure (herds testing not negative) at 40%. Through increased awareness and action on the disease, the voluntary testing of around 50% of herds in Scotland revealed that just under 30% of herds had been exposed. The current level of BVD exposure in Scottish herds is around 16% as indicated by not negative test results. This shows that the steps being taken so far by the industry and by vets is producing a substantial reduction in BVD disease prevalence in Scotland. Over 2,000 persistently infected animals have already been identified and the vast majority of these are now dead.

Differences in disease prevalence, beef and dairy

Since the introduction of mandatory screening the percentage of beef herds testing not negative for BVD has reduced to 12%, and there has been a recent reduction in the exposure levels in in dairy herds, which are now at 39%, having stayed static at around 50% testing not negative for the past few years. The bulk milk tank will indicate infection throughout the history of a herd and may indicate a historic rather than current infection. The removal of the bulk milk tank tests should give a more accurate picture of the level of exposure in dairy herds.

Differences in BVD exposure levels by county



You can see by the above map from 2014 that there are differences in the levels of exposure to BVD by county. The darker the area the higher the incidence of BVD exposure in that county. For those who have a not negative status in a low BVD area, hunting and removing PIs will make a big difference to the county status. For those who have a negative result in counties with a higher prevalence, biosecurity is of great importance.

BVD MYTH BUSTER

1. **Got BVD? Don't worry, you can just vaccinate.**

   FALSE – Vaccination does not deal with PI animals. They continue to spread infection potentially creating yet more PIs in spite of herd vaccination.

2. **You should keep a PI animal on the farm so that your animals are not naive, i.e. the idea of PI parties.**

   FALSE – PI animals are highly infectious and should be culled as soon as they are identified. They will cause huge problems on your farm. Vaccination is the only effective way of protecting naive animals that may come into contact with BVD.

3. **The government is making vaccination compulsory/the government is banning vaccination.**

   FALSE – Vaccination will continue to be an important part of controlling BVD for many herds, but it is a decision to be taken between keepers and vets.

4. **You can't get rid of BVD, because of transient infection.**

   FALSE – The evidence is overwhelming that removing the PI animals will stop the disease from circulating. Transiently infected animals are much less infectious than PIs, and only for a short period of time, if they are infectious at all.

5. **There's no point in getting rid of BVD, because my herd will be re-infected by sheep/deer.**

   FALSE – Sheep can carry BVD and can re-infect your herd, but only if they have been in contact with cattle with BVD in the first place. Removing the source of infection – the PI cattle – will reduce BVD among sheep. Also, transmission from sheep to cattle is very weak, so only a small number will be unlucky enough to get re-infected this way. To be sure though, you should keep breeding cattle away from sheep.

   Deer can carry BVD, but we've no evidence to think this is a significant problem, and again, removing PIs will remove a major source of infection for deer.

6. **It's impossible to eradicate BVD from my herd – I've been trying for years.**

   FALSE – The vast majority who have followed a CHeCS scheme have got rid of BVD within two years. If you test to find your PIs, slaughter them, buy-in only BVD-free cattle or isolate and test them, test your calves for two years, and exercise good biosecurity, you should get rid of a BVD infection in around two years. All the studies show that the benefit to your profits will far outweigh the cost of getting rid of BVD.

7. **I've got a PI animal, but it looks alright so I don't need to slaughter it, I'll just finish it.**

   FALSE – Very few PI animals ever reach a good slaughter weight. While it's on your farm it is a significant disease risk to the rest of your herd. It's always better to send it for slaughter immediately.

NOTES

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This document is also available on the Scottish Government website: www.gov.scot

For more information go to **www.gov.scot/bvd**

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