The Scottish BVD Eradication Scheme:
A Guide to Mandatory Annual Screening for Vets in Practice

January 2014

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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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 quarter of holdings have active BVDV 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.scotland.gov.uk/bvd. Copies have also been sent to all livestock veterinary practices.
THE SCOTTISH BVD ERADICATION SCHEME

Key features of new legislation (phase 3)

- Any animal identified positive for BVD virus on the most recent test will be assumed PI and is not allowed to move other than directly to slaughter.

- Animals from untested herds will not be allowed to move other than directly to slaughter.

- The current BVD status of a herd or animal must be declared at point of movement, that is to the operator of a market, the prospective keeper or anyone to whom the herd or animal is to be placed in temporary control.

- Every keeper of a breeding cattle herd must screen their herd annually.

- Samples must be sent to an approved laboratory along with any information they need.

- The laboratory will declare a herd status of ‘negative’ or ‘not negative’, depending on the outcome of the test result. Laboratories must also inform the Scottish Government of any BVD test result whether for an official screening test or not.

- The laboratory must inform the keeper and the Scottish Government of the result.
Persistently infected (PI) animals

The key to the success of the Scottish BVD eradication scheme will be the identification and removal of PI animals from the bovine population. **From 1st January 2014 any animal that tests positive for BVD virus will only be allowed to move directly to slaughter.** To ensure that an animal is not transiently infected it should be retested after three weeks. If on the second test the animal is antibody positive and virus negative it may move again.

In exceptional circumstances, such as for immediate welfare issues, a veterinary inspector may allow an infected animal to move under licence through applying to AHVLA.

BVDV infected animals may not pass through a market or any other holding. The Scottish Government will be informed by the laboratory 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.

Untested herds

If a keeper fails to test their herd they may not move an animal forming part of the breeding herd other than directly to slaughter. If necessary a veterinary inspector can allow an infected animal to move under licence. On completion of a mandatory screening test, animals will be permitted to move again.
**Herd declarations**

From 1st January 2014 the keeper of a breeding herd will be required to declare their herd’s BVD status at the point of movement. That will be either to the operator of a market to which the herd or animal is to be moved, the prospective new keeper of an animal or to anyone who is placed in temporary control of the animal. The legal requirement is for keepers to declare the status (i.e. ‘negative’ or ‘not negative’) of their herd or animal at the point of sale. Buyers should also ensure they have been given this information prior to purchase. How this information is provided is for keepers to determine but one option would be to use the information held on the BVD database. For the purchaser to access this information keepers will need to provide relevant CPH/animal ID numbers. A purchaser can be confident that the information found on the database is accurate for the holding/animal checked.

The ScotEID database at [www.scoteid.com](http://www.scoteid.com) is the central point at which all BVD results can be found. All approved laboratories report their results directly to the database. You can find the status of any herd, and any individual animal tested on the database if you have the CPH and individual animal number. Help on how to use the database is provided on the website or through the BVD helpline on 0300 244 9823.
**Additional voluntary herd declarations**

In addition to the mandatory herd declarations, markets may also use the risk matrix displayed below. This assigns a PI risk for animals sold, with category 1 being the lowest risk and category 3 being the highest. This is designed to help with purchasing decisions, but is not a guarantee of individual animal status. The only way to be certain of an individual animal status is for the animal to have an individual virus test result. The database will assign a herd as category 1, 2 or 3 but this category may require some interpretation for individual animals as the database cannot know if an animal is pregnant or not. **Please note, pregnant animals are always a greater risk and therefore cannot be assigned as category 1** (very low risk). Pregnant animals, which would otherwise be category 1 must be assigned to category 2 (low risk).

<table>
<thead>
<tr>
<th>Category</th>
<th>Standard</th>
<th>Risk of being PI</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BVD category 1:</strong> BVD certified negative</td>
<td>Cattle are <strong>not</strong> pregnant and are either: From an accredited BVD-free herd through a CHeCS cattle health scheme OR Individually tested BVD virus-free</td>
<td>Very low risk</td>
</tr>
<tr>
<td><strong>BVD category 2:</strong> BVD herd screen negative</td>
<td>From a herd with a ‘negative’ BVD herd status though mandatory annual screening. OR Pregnant cattle that would otherwise be in category 1.</td>
<td>Low risk</td>
</tr>
<tr>
<td><strong>BVD category 3:</strong> BVD status unknown</td>
<td>All cattle not in categories 1 or 2 (including from ‘not negative’ herds)</td>
<td>Risk unknown</td>
</tr>
</tbody>
</table>
Mandatory screening for breeding herds
Keepers of breeding herds of cattle in Scotland must continue to have their herds screened annually 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 would be enough.

Each test must be conducted within 13 months of the last one.

How must they be screened?
A range of six minimum testing methods is available, and these are set out in full at Part 3 below. These are minimum requirements; it will often be in your clients’ interests to do more than this and we would recommend that you advise follow-up testing where a ‘not negative’ status has been given.

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.
Who can take samples?

<table>
<thead>
<tr>
<th>Sample Type</th>
<th>Veterinary surgeon</th>
<th>Veterinary nurse</th>
<th>Milk recorder</th>
<th>Milk collector</th>
<th>Keeper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ear tissue tag</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Individual milk</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bulk milk</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

Who can test samples?

To constitute a mandatory screening test, samples must be tested by a laboratory approved by the Scottish Government - see Part 3 and Part 5 for more details. A list of approved laboratories is available at [www.scotland.gov.uk/bvd](http://www.scotland.gov.uk/bvd).

Who determines the herd status?

The laboratory will determine the herd status, based on the results of the samples submitted and other information provided.

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.
Phase 4 Anticipated restrictions on ‘not negative’ herds

Movement restrictions – likely introduction December 2014

‘Not negative’ herds
At the moment we encourage keepers to increase testing on ‘not negative’ herds to establish if they have a PI or not. However, there is currently no legal requirement to do so.

From December 2014 we intend to make it a legal requirement to individually test animals from a ‘not negative’ herd. If a keeper fails to do this, they will be unable to move their animals other than directly to slaughter. Where PI animals are identified through increased testing these animals will not be able to move other than directly to slaughter.

Restrictions on bovine animals from outside Scotland
At the same time as restrictions are placed on ‘not negative’ herds, it is likely that testing will be required for any animal that enters a herd from outside an eradication scheme. Animals without a herd status, and that have not been individually tested for the presence of BVD virus, shall have to be tested within a defined period to ensure they are free from BVD virus.
MINIMUM TESTING METHODS

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

Rather than only have one testing method available such as ear tissue tag testing, as has been used in BVD eradication schemes in Switzerland, Germany and Ireland, a range of methods have been developed. This reflects Scotland’s relatively low disease prevalence; as most herds in Scotland are free of BVD virus at any one time, it is important to allow such herds to demonstrate that as cost-effectively as possible. It also reflects the diversity of farming practices, from crofting to large commercial breeders.

For those with BVDV infections, the priority is that the testing method should help them move towards identifying and removing PI cattle.

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

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 those in CHeCS schemes will not need to do anything more than fulfil the requirements of their health scheme.

All herds must be tested using one of the following six methods. The first three methods can be used in both dairy and beef herds.
1. Sampling calves – the check test (Antibody)

Whenever possible for a check test, ensure your clients use option (a), this may involve scheduling appointments when the majority of calves are aged between 9 and 18 months. This age range is the most appropriate for detecting antibodies. If option (a) is not possible perhaps as a result of farmers selling animals before they reach 9 months, then options (b) and (c) should be followed in order.

Where there are fewer than the required number of animals in each management group, a vet should make a decision as to whether they believe there are enough animals in the group to be used as an accurate check test. Factors to consider will include the number of animals in the herd, different age groups etc. The online CPD should assist you in making this judgement.

The check test is an antibody test and will pick up exposure to the virus. PI animals will be antibody negative therefore an optimum number of animals should be chosen that would mitigate a risk of all calves tested being PIs. Where there is 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.

For all available options the animals being tested should ideally not have had any vaccine with a BVD component, and should certainly not have had a BVD vaccine within the preceding month. If they have been vaccinated, when submitting the samples please ensure that their vaccination dates and vaccine name are provided to the laboratory. The bloods must be tested for BVD antibody. If all the samples are negative for BVD antibody this will constitute a negative result for that year.
Each separately managed group must be identified and sampled otherwise the test may fail to detect infection when it is present – please see Part 4 below for more advice. You should speak to your client before cattle are selected for sampling to ensure that all separately managed groups have been identified.

a) Five calves aged 9 to 18 months
Take samples of blood from not less than five calves in the age range 9 to 18 months in each separately managed group (see page 21 for more information). If there are fewer 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.

(b) 10 Calves 6-18 months
If any of calves sampled are aged 6 to 9 months, then take a sample of blood from not less than ten calves in the age range 6 to 18 months in each separately managed group. If there are fewer than ten animals in this age range you should advise if this test is appropriate or if a different testing option would be preferable.

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 to 18 months. If there are fewer 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 you consider that there are too few animals aged 6 to 18 months in a management group to test, 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 separately managed group. If there are fewer than five animals in this age range then you should advise if this test is appropriate or if a different testing option such as a full herd screen for antigen would be preferable.

2. Test all calves (Antigen/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 (Antigen/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 this will constitute a ‘negative’ result for that year.

This may suit herds where BVDV infection is suspected or herds where no other method is entirely suitable.
**Dairy testing methods**

The remaining testing methods are for dairy herds only. If your client has had one or more bulk milk tank tests that has resulted in a ‘not negative’ herd status being applied then you should advise a different testing method.

4. **Single bulk tank milk (BTM) and blood tests (Antibody)**

Test a single bulk tank milk (BTM) sample plus individual bloods from any cows that did not contribute to the bulk tank that day, including dry cows and in-calf heifers, for antibodies to BVDV. If the milk goes into more than one tank a separate sample from each tank should be tested. If all the samples are negative for antibodies this will constitute a ‘negative’ result for that year.

5. **Four quarterly bulk milk tests (Antibody)**

A representative milk sample from the bulk tank(s) should be tested for antibodies to BVDV. Four quarterly BTM tests in one year, each not less than 80 days and not more than 100 days apart, are needed.

Four consecutive negative BTM tests are needed to constitute a ‘negative’ result for that year. Following one positive result, it may be preferable to discontinue quarterly testing and switch to a more focussed testing method, such as a first lactation milk test (detailed on the following page), or testing calves.
6. First lactation composite milk test (Antibody)

A composite sample made of milk from each of the cows in the herd in their first lactation can be tested for antibody. This is a useful test in herds where the BTM is positive for antibody.

Testing options summary table

<table>
<thead>
<tr>
<th>No.</th>
<th>TESTING OPTION</th>
<th>DAIRY/ BEEF</th>
<th>TEST FOR ANTIBODY or ANTIGEN/VIRUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1a</td>
<td>Five animals between 9 to 18 months per separately managed group</td>
<td>Either</td>
<td>Antibody</td>
</tr>
<tr>
<td>1b</td>
<td>Ten animals between 6 to 18 months per separately managed group Shetland only – test five animals from this age range</td>
<td>Either</td>
<td>Antibody</td>
</tr>
<tr>
<td>1c</td>
<td>If neither above are possible test - five animals 18 months+ on holding since birth per separately managed group</td>
<td>Either</td>
<td>Antibody</td>
</tr>
<tr>
<td>2</td>
<td>All calves</td>
<td>Either</td>
<td>Antigen/Virus</td>
</tr>
<tr>
<td>3</td>
<td>All animals</td>
<td>Either</td>
<td>Antigen/Virus</td>
</tr>
<tr>
<td>4</td>
<td>Bulk milk plus dry</td>
<td>Dairy</td>
<td>Antibody</td>
</tr>
<tr>
<td>5</td>
<td>Quarterly bulk milk</td>
<td>Dairy</td>
<td>Antibody</td>
</tr>
<tr>
<td>6</td>
<td>First lactation</td>
<td>Dairy</td>
<td>Antibody</td>
</tr>
</tbody>
</table>
TESTS AVAILABLE

Blood serum or plasma and milk can be used to test for antibody to BVDV. Blood and tissue can be used to test for BVD virus antigen. Milk may be tested for virus but only by the polymerase chain reaction (PCR), as it is sensitive enough to screen BTM for the presence of a PI. As high levels of maternally derived antibodies in colostrum can block the detection of BVD virus, blood can only be tested for antigen if the calf is over four weeks old. This restriction does not apply to skin samples collected during ear tagging which can be tested for antigen from calves of any age.

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 serum/milk samples are clearly negative or positive. Those with readings around the negative/positive cut-off value may be classified as inconclusive. The SG 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 anti-BVDV antibody.
**Vaccinated animals**

Vaccination has the potential to lead to weak false positives in an antibody test. It is therefore advisable where possible to use unvaccinated animals for a screening test. Where this is not possible please make sure the lab is aware of the vaccination status as they may be able to interpret results accordingly.

Low or inconclusive levels of antibody in one or two animals in a group will require careful interpretation. 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.scotland.gov.uk/bvd](http://www.scotland.gov.uk/bvd)). Vets who have successfully completed the CPD course can sanction such changes in a herd’s BVD status by calling the BVD helpline on 0300 244 9823.

**Other tests for BVD antibody**

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

Virus antigen detection ELISA

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.

A virus positive animal 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 infection at the first test will be virus negative and antibody positive at the second test. A PI should test antibody negative.

BVD vaccination will not interfere with any test to detect BVD virus. 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.

This test is suitable for blood and tissue samples. For blood samples a calf should be over one month old but check the requirement with the laboratory. This is not a suitable test for bulk milk samples.
Other BVD virus detection tests

Other tests to detect virus are available. The most sensitive of these is the reverse transcriptase polymerase chain reaction (RT-PCR) which detects virus RNA. The test is used to detect virus in bulk milk from up to 300 cows, pooled blood samples and foetal tissues. There is some indication that pooling blood samples is not advisable in the very young calf and the age of calves less than two months of age should always be provided with the samples. It is advisable to consult with your laboratory on the age threshold for pooling before submitting samples.
Table of tests available by laboratory

At the date of publication, eight laboratories are approved for testing for the BVD eradication scheme. A table of the tests available at each of these laboratories can be found below. Please note this information is correct at the time of publication and subject to change. For up to date information and contact details for laboratories please consult the website: www.scotland.gov.uk/bvd

<table>
<thead>
<tr>
<th>Sample type</th>
<th>Antibody (ELISA)</th>
<th>Antigen (ELISA)</th>
<th>RT-PCR or other virus test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood</td>
<td>1 2 3 4 5 6</td>
<td>1 3 4 5 6 7</td>
<td>1 2 3 6</td>
</tr>
<tr>
<td>Milk</td>
<td>1 2 3 4 6 8</td>
<td></td>
<td>1 3 6</td>
</tr>
<tr>
<td>Tissue</td>
<td></td>
<td>1 3 4 6 7 8</td>
<td>1 2 3 6</td>
</tr>
<tr>
<td>Semen</td>
<td></td>
<td></td>
<td>1 2</td>
</tr>
</tbody>
</table>

1) AFBNI  5) NWL
2) AHVLA  6) SAC
3) Biobest 7) LGC
4) NML  8) The CIS
WHAT CONSTITUTES A MANAGEMENT GROUP?

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

The point of testing separately managed groups is to identify whether there is a PI animal within the herd. 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 in Part 3 from page 10).

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**

<table>
<thead>
<tr>
<th>PEN 1</th>
<th>PASSAGEWAY</th>
<th>PEN 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>PEN 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PEN 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PEN 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PEN 5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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 to 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 above, 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 among 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.scotland.gov.uk/bvd](http://www.scotland.gov.uk/bvd).

**An appropriate history should be sent 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 and address.
2. The CPH number for the Holding on which the herd is kept.
3. The date samples were taken.
4. Which testing method (see Part 3) was chosen.
5. Whether samples are to be tested for the presence of BVDV or evidence of exposure to BVDV, i.e. tested for antigen/virus or antibody.
6. The **full 12 character** official UK ear tag numbers for all the animals from which the samples derive (with the exception of the bulk milk tests).
7. The number of breeding females in the herd.
8. The seasons of calving.
HERD STATUS DECLARED – WHAT NEXT?

The laboratory will 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

In December 2014 it is likely that new legislation will be introduced, which will detail consequences for herds with a ‘not negative’ status. 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 or brought on 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 blood 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

• If a dairy herd has received a ‘not negative’ result on one or more occasion through a milk screen a follow-up test can be applied.

• 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.

• 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 blood testing for virus all calves born into the herd for 12 months following the removal of the last PI animal.

Alternatively, 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.scotland.gov.uk/bvd. It takes up to 2 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 the Scottish BVD Database Unit on 0300 244 9823.

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

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

Or

• “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.
BASIC FACTS ABOUT BVD

This section contains veterinary information on BVD. This has been produced by SAC, and is included in the online CPD required for vets wishing to change a herd status (follow the link on www.scotland.gov.uk/bvd). There is also a 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, 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 naïve cattle, but transiently infected animals are much less infectious than PI animals. 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 currently 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.

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 2 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
MANDATORY SCREENING RESULTS

Overall, there has been a good uptake from the mandatory testing, with over 90% compliance. Letters were issued to all keepers who had not carried out testing on their herds reminding of them of their obligations.

What is the current 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. We have now assessed the results from the first round of mandatory testing and these show that exposure to BVD is now at just over 20%. This is a great result and shows that the steps being taken so far by the industry and by vets is producing a reduction in BVD disease prevalence.

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 16%, but there has been no change in dairy herds, which remain at 53% testing ‘not negative’. A positive bulk milk tank antibody result may indicate a historic rather than current infection. Therefore, if you have dairy farmer clients, with a ‘not negative’ resulting from a bulk milk screen please encourage them to carry out further testing to identify any active BVD infection.
Differences in BVD exposure levels by county

The map above shows the differences in the level of exposure to BVD by county. The darker the area, the higher the number of herds that have evidence exposure to BVD 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. Circulating infection will cause huge problems on your farm. Vaccination is used to protect 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.
5. There’s no point in getting rid of BVD, because my herd will be re-infected by sheep/deer.

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 in under 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.