BORDER DISEASE SHEEP HEALTH SCHEMES

Why join?

- Border disease is being detected with increasing frequency in sheep flocks. It is caused by a virus, which is very closely related to BVD virus of cattle. Buying-in virus carrier sheep is the most common way of introducing infection to a flock.
- Currently no source of Border disease tested sheep exists apart from a small number of rams that are tested pre-sale for the virus. Flocks selling breeding replacements may therefore wish to join the scheme to market their sheep with a higher health status.
- Flock owners may wish to screen for their own monitoring purposes and to detect any early incursion of infection as disease can have a significant economic impact.
- If there is a cattle herd on the same premises then screening can identify the risk of the flock to the herd. Border disease virus can very occasionally infect cattle resulting in a similar picture as BVD. Sheep can carry BVD virus and can sometimes be a risk to cattle though more commonly the sheep are at risk from cattle carrying BVD virus, which can cause the same signs as Border disease.

Background

- Sheep exposed to virus for the first time during tupping or pregnancy can have the greatest impact. High barren rates of up to 50% can occur in addition to increased numbers of abortions, stillbirths and the birth of small, weakly lambs.
- Virus carrier lambs can be born if infection of the ewe has occurred for the first time in early pregnancy and these lambs are persistently infected (PI) so shed the virus for life. They are often poor doers but can look healthy. If they survive and enter the breeding flock their lambs will also be born persistently infected with the virus. Pregnant ewes when first exposed to Border disease virus can produce lambs with skeletal deformities, an abnormal fleece with long hair fibres present and sometimes a body tremor, which leads to them being known as “hairy shakers”. Some of these will be PI animals.
- Economic losses tend to be at their highest when infection is first introduced to a flock, which is usually due to having bought in a virus carrier. However the continued presence of virus in a flock can cause significant losses for years as infection tends to spread slowly, particularly in extensive systems, so susceptible animals can be present for a long time.
- There is no vaccine against Border disease.
- Border disease (BD) virus can very occasionally infect cattle and cause the same effects as BVD virus. Sheep carrying BD or BVD virus could be of increasing importance as many cattle herds have now eradicated, or are in the process of eradicating, BVD virus. The tests will detect both Border disease and BVD virus, or exposure to them, and the standard lab tests will not differentiate them.
- It is possible to test sheep for Border disease/BVD virus to avoid selling or introducing virus carriers.
- Flocks can be screened for evidence of active Border disease infection, along similar lines to the BVD programmes in cattle, by testing a proportion of the young sheep for antibodies to the virus.

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- Sheep can become infected with the virus without showing any obvious clinical signs. They will clear the virus from their bodies within a week to ten days but during that period they can be infectious to others. If they are in early pregnancy when first infected with the virus the unborn lamb cannot clear the virus so will be born persistently infected (PI) with virus. These PI sheep do not produce antibodies to the virus. Other sheep will produce antibodies within a couple of weeks of being infected with the virus and these antibodies persist for many years afterwards. Testing a proportion of the young sheep for antibodies to Border disease can therefore indicate if there is likely to be active, or recent exposure to, Border disease virus in the group.

Two Border disease test programmes are available depending on the level of flock biosecurity:

1. **Border disease Accreditation Scheme** (requirement for a minimum 2 metre gap at all points between any adjacent flocks)
2. **Border disease Monitored-Free Scheme**. This is a lower status programme as there is no requirement for a gap between adjacent flocks. In this programme in-lamb female sheep or ewes with young lambs at foot cannot be sold with Border disease Monitored-Free status due to the lower level of biosecurity.

Testing requirements

Only lowland flocks can gain status. The same flock screening tests apply to each programme. Testing needs to have been carried out on a proportion of the current year's lamb crop before they can be sold with Border disease status. To gain status clear screens are required on two consecutive lamb crops. There are also rules relating to sheep being added to the flock.

Year 1 (First Qualifying Test):

- Blood sample 12-15 homebred lambs (as per TABLE 1 BELOW) **aged at least 4 months old** (but if possible 5-6 months old, up to a maximum of 12 months old) **from each group/field** for antibodies to Border disease virus. To be classed as a group the lambs should have been mixing for at least two months. If shorter than this, a proportion from each of their previous groups should be tested (according to the figures in table 1 below) based on the original group numbers.

TABLE 1

No. of lambs in **group**	No. of lambs to blood sample from **each group** (95% confidence of detecting a 20% seroprevalence)
25	12
50	14
80	14
100+	15

- At the time of the first qualifying test, if sheep have been purchased since the previous tupping period it would be advisable to test them for the virus. Samples can be pooled for virus testing. Samples from any positive pools will need to be tested individually at additional cost

- Any sheep to be added to the flock after the first qualifying test, must originate from a Border disease **Accredited** flock or be tested for **virus** before being added to the flock. Border disease Monitored-Free flocks can add sheep from other BD Monitored-Free flocks (providing they are not in-lamb ewes or ewes with young lambs at foot, in which case the lambs need to be tested for virus before they can be added).
- If in-lamb females are being added from a flock that is not Accredited for Border disease virus, the group must remain in isolation until the lambs are born and can also be tested for the virus.

FAST TRACK OPTION TO POTENTIALLY GAIN STATUS IN YEAR 1:

In addition (for fast track option only):

- Blood sample 8-11 homebred yearling sheep (**aged 12-24 months**) from each separate group for antibodies to Border disease virus (according to the numbers in TABLE 2 BELOW).
- If there are no sheep in this category then two consecutive clear screens of lamb crops a year apart will be required to gain status.

In addition (for fast track option only):

- Blood test any rams that were not used in the last breeding season. Any barren ewes that are not being culled plus any flock replacements that have been bought-in since the previous tupping period must also be tested for virus (unless they have been mixing with the lambs in the main flock for at least two months). These sheep will be tested for virus. Samples can be pooled for testing (up to ten per pool). Samples from any positive pools will need to be tested individually at additional cost.

TABLE 2

Number of homebred yearlings in group	No. of yearlings to blood sample from each separate group (THIS TESTING IS REQUIRED IN YEAR 1 IN FAST TRACK OPTION ONLY) (95% confidence of detecting a 30% seroprevalence)
25	8
30	9
50	10
100	10
200	10
500	10
800+	11

YEAR 2 (Second Qualifying Test) & SUBSEQUENT YEARS (for all flocks):

- On an annual basis blood sample 12-15 homebred lambs aged 4-12 months old **from each group/field** for antibodies to Border disease virus (according to the numbers in TABLE 1).
- Any sheep to be added to the flock must originate from a Border disease **Accredited** flock or be tested for **virus** before being added to the flock. Samples can be pooled for testing. Samples from any positive pools will need to be tested individually at additional cost. If in-

lamb females are bought from a flock that is not Accredited for Border disease virus, the group must remain in isolation until the lambs are born and can also be tested for the virus.

AWARDING OF STATUS

If all samples are negative for antibodies to Border disease virus at each qualifying test, and providing any sheep tested for virus have negative results, the flock will gain Border disease Accredited Free or Monitored Free status, as appropriate. This may be in the first year, if the fast track option has been followed, or in the second year of testing once two consecutive lamb crops have been screened with negative results. A flock health declaration will be issued once two clear screens have been achieved and a signed declaration has been received from the flock owner/manager confirming that the flock has been complying with the scheme rules.

Status will be valid for up to 12 months however a proportion of each lamb crop must be screened (as per table 1) before they can be sold with Border disease Accredited or Monitored-Free status.

For Border disease Monitored-Free flocks: in-lamb females and ewes with young lambs at foot cannot be sold with Border disease Monitored-Free status.

Scheme Rules

A proportion of the most recent lamb crop must be screened (as per table 1) before they can be sold with status.

Border disease Accredited or Monitored Free sheep must not mix or be housed with sheep that do not have the same Border disease flock status or an individual negative result for Border disease virus.

If Border disease Accredited or Monitored Free sheep are attending shows then contact with adjacent penned sheep should be minimised where possible e.g. through the use of tarpaulins/plastic sheeting. During judging mouthing should be done by the handler not the judge.

In the Border disease Monitored-Free programme any in-lamb females or ewes with young lambs at foot cannot be sold with Border disease status due to the lower level of biosecurity.

Colostrum can only be used that has been obtained from ewes with Border disease Accredited (or Monitored-Free status, if in the Monitored-Free programme) or from a ewe that has had a negative test result for Border disease **virus**.

Semen and embryos can only be used from sheep that are:

- Border disease Accredited or
- Border disease Monitored Free (only for flocks in BD Monitored-Free programme) or
- Blood sampled and have a negative Border disease **virus** result prior to collection of semen or embryos or at any stage subsequent to collection and prior to use of the semen/embryos.

Equipment that is shared with sheep with no Border disease status must be cleaned and disinfected before use e.g. livestock trailers.

All sheep must be identifiable with a UK flock number and individual animal number so that blood test results can be matched to individual animals.

The flock's movement records must be available for inspection by the veterinary surgeon at the time of any blood testing for the scheme.

Axiom Veterinary Laboratories are not liable for any losses incurred as a consequence of a member's loss of status or failure to gain status.

Suspected clinical disease

If there are any suspicions of clinical disease due to Border disease virus in a flock (e.g. the birth of hairy shaker lambs or increased barren rates for that flock) then testing must be carried out to exclude the presence of virus. Sheep must not be sold with status until disease has been ruled out.

Positive results

If any samples from sheep in the flock are positive for Border disease virus (unless in quarantine isolation) or if antibodies are detected in young sheep at the annual screen, the flock's status will be suspended with immediate effect.

If one sample tests as positive for antibodies to Border disease the animal can be retested after a minimum of two weeks to confirm the result. If it retests as antibody negative no further testing will be required. If it retests as antibody positive, sampling of a further ten lambs from the group will be required if attempting to gain status. Lambs aged 4-6 months old will occasionally have residual maternally derived antibodies from colostrum. Where time allows, any retesting to confirm status should be left as close to six months of age as possible.

If two or more samples from homebred sheep test as positive for antibodies to Border disease virus it is likely that there has been recent exposure to Border disease virus in the flock. However lambs aged 4-6 months old will occasionally have residual maternally derived antibodies from colostrum. Where time allows, any retesting to confirm status should be left as close to six months of age as possible. If evidence of active infection is suspected in the flock further advice will be given as to how the virus could be eradicated from the flock.