Herdsure® protocol for IBR in cattle herds

AHVLA
Animal Health and
Veterinary Laboratories
Agency

Herdsure®

Introduction

This protocol describes the process used to establish the disease status for infectious bovine rhinotracheitis (IBR) in cattle and for the subsequent monitoring of IBR in those herds.

This protocol is suitable for both dairy and beef herds.

The three main elements of this Herdsure® protocol for IBR are:

- sampling and testing to determine herd status.
- sampling and testing to identify infected cattle so that they may be removed from the herd.
- advice on appropriate measures to reduce the risk of re-introducing IBR virus infection, together with sampling and testing to monitor the improved IBR status of the herd.

The IBR protocol comprises three levels of 'health status':

Level 1	Establishes the IBR status of the herd.
Level 2	Aims to improve the health status of the herd for IBR.
Level 3	Monitors and aims to maintain the improved (or established as satisfactory at Level 1) health status of the herd for IBR.

Please also refer to the flowchart summary of the protocol presented at the end of Level 3.

The disease

Introduction

Infectious bovine rhinotracheitis (IBR) is caused by bovine herpes virus 1 and is a major cause of disease in cattle. The virus primarily causes respiratory disease and infected cattle can harbour it for life.

Surveys suggest that more than half of UK herds are infected with IBR. Since several European countries have achieved national IBR-free status for their cattle through national control plans, IBR infection is a potential barrier to international trade.

The disease

IBR infection can result in a spectrum of clinical signs from severe fatal disease to mild disease that may go unnoticed. Outbreaks of disease can be seen in cattle of all ages but IBR is the most common cause of respiratory disease in cattle 12 to 18 months of age. It is also commonly seen in young adult dairy cattle after introduction to the milking herd.

IBR most frequently affects the upper respiratory tract, causing an increased respiratory rate, raised temperature and discharges from the eyes and nostrils. There may be an obvious reddening of the lining of the eyelids or nostrils. If there is extensive damage to the trachea it can cause severe breathing difficulty and can be fatal.

Abortion at any stage of gestation can be a consequence of infection with IBR and this can follow either a recognised outbreak of disease in the cows or an episode of infection where no obvious clinical signs were present.

IBR causes loss of production though longer times to finishing and deaths in growing cattle and decreased milk production, abortion and deaths in adult cattle.

IBR can also be transmitted by natural service, causing a painful inflammation of the penis or vulva and formation of white pustules on the mucosa. Fortunately this mode of transmission is not common in herds in the UK.

As mentioned above, IBR infection can occur in a herd where there have been minimal clinical signs. The absence of obvious clinical signs does not mean that IBR infection is not present in a herd.

Spread of IBR

Spread of IBR is by close contact between cattle, usually through nose-to-nose contact. Cattle with clinical signs are the most infectious but IBR has the ability to survive in cattle long after they have recovered from the initial infection. These cattle are called ‘latently infected’. They may become infectious again and spread disease after periods of stress and while not showing any clinical signs.

The spread of disease between herds is frequently a result of the purchase of latently infected cattle and often outbreaks of disease are seen shortly after the introduction of cattle.

Disease can be spread by nose-to-nose contact with infected stock in adjoining fields or by straying of cattle.

Disease can also be spread by using shared equipment or by personnel moving between farms, although the virus can only survive for a few days in the environment and is susceptible to disinfectants.

Theoretically, infection could also be introduced to a herd by the purchase of semen for AI but the stringent controls and tests on AI studs makes this route of infection extremely unlikely.

Control of IBR

The introduction of IBR infection to a herd can be prevented by the application of strict biosecurity measures.

Cattle that are latently infected can be detected as they nearly always have antibodies to IBR. Latently infected cattle can spread infection to other cattle. So, to remove infection from a herd, all antibody-positive cattle must be removed. IBR infection can be eliminated from a herd by repeated testing and removal of all antibody-positive cattle. This 'test and cull' policy has been successful in herds in many countries.

Where a large proportion of the herd is infected, the test and cull route is not a practical option but it is possible to limit or stop the spread of infection by vaccination. The antibodies produced by conventional vaccines do not allow vaccinated animals to be differentiated from those infected by IBR. However, vaccines called 'marker vaccines' have been developed whereby, using a special antibody test, it is possible to differentiate between marker-vaccinated cattle and those infected with IBR.

Vaccination of a herd using a marker vaccine stops or severely limits the spread of disease in a herd while still allowing the detection of IBR-infected cattle. This is one of the options in Herdsure® and has been used in control programmes in several countries.

Detecting and removing the virus

Infection of an animal by IBR virus produces an antibody response that can be detected in a blood or milk sample. The ELISA test is used to detect antibody. The sensitivity of this test is extremely high.

When cattle in the herd are vaccinated with IBR marker vaccine, an ELISA test that does not detect antibody produced in response to vaccination with marker vaccine will be used. This will enable the identification of cattle infected with disease strains of the virus rather than cattle vaccinated with marker vaccine. The latter test, however, cannot be used for milk samples.

Biosecurity

Avoiding the introduction of the virus into a 'clean herd'

It is the responsibility of the herd owner or manager, in consultation with their veterinary practitioner, to ensure good biosecurity in Herdsure® herds. The following potential means of introduction of IBR into herds should be addressed and kept to a minimum. Where herds are seeking CHeCS accreditation the veterinary practitioner will be asked to confirm that the appropriate biosecurity and management measures have been implemented on the farm.

- **movement of people, vehicles or equipment** into areas where the cattle are kept (including fields, farm buildings and other holding areas) should be kept to a minimum.
- **people entering premises** to handle the cattle (or their products) should wear protective clothing and footwear. These must be clean and disinfected before and after contact with the cattle. Alternatively, disposable protective clothing can be used. Other visitors to the farm should be kept away from direct contact with the cattle.
- **shared farm equipment:** Equipment, machinery, livestock trailers and handling facilities that are used on herds of unknown IBR status must be cleaned and disinfected before using with herds subscribed to Levels 2 and 3 of the Herdsure® protocol for IBR.
- **other vehicles** entering the farm should not come into contact with the areas used by cattle unless they have been thoroughly cleaned and disinfected.
- **delivery and pick-up points** should be at a site isolated from other cattle on the farm. Drivers should remain in their cabs and should not assist in removing cattle from pens unless they are using farm-dedicated protective clothing and footwear.
- **veterinary equipment** such as drenching guns, surgical instruments and hypodermic needles, which may draw blood, must not be shared with cattle from another herd. Veterinary surgical instruments must be sterile before using with the herd.
- **farm boundaries** must prevent cattle from straying off or onto the farm and must prevent nose-to-nose contact over fences or walls. Installation of double fencing, with a gap of 3 metres, between cattle and any neighbouring cattle is essential.
- **contact with cattle of different health status:** Cattle herds subscribed to Levels 2 and 3 of the Herdsure® protocol for IBR must not come into contact with cattle from herds which are not of an equal or higher Herdsure® IBR status, otherwise they will lose their status. To re-introduce them to the herd, they must be regarded as added cattle.
- **added animals** are particularly high risk sources of new infection and must not be added to a Herdsure® herd unless they are of similar or superior health status. Otherwise, they must be placed in isolation for the required period and tested by the appropriate test(s).
- **isolation facilities:** An isolation facility that prevents contact with other stock must be provided for all bought-in cattle. A dedicated building separate from other cattle buildings is required. The air space, drainage or dung storage area should not be shared with other cattle. Dung should only be spread on land or added to the main

dung store when all cattle in the isolation facility have passed all the required health tests and been added to the herd. Where cattle are confirmed as antibody positive, dung must not be disposed of onto pasture that is to be grazed by cattle within 12 months.

- **isolation period:** All cattle entering the herd should be isolated for 4 weeks and appropriate testing carried out. It is only when both the isolation period and the requisite tests have been completed, with results indicating freedom from infection, that these cattle can enter the herd.
- **feed and bedding:** When buying feed and bedding, care must be taken to avoid the risk of introducing infection into the herd. Feed and bedding stores should be protected against access by vermin and wildlife.
- **CHeCS accreditation:** there must be a 2 month interval before accredited cattle follow non-accredited cattle onto pasture. The same grazing restrictions apply to accredited cattle if slurry or manure collected from non-accredited cattle has been used on the pasture.
- **notification:** Herd owners and managers who are participating in Herdsure® must inform the supervising veterinary practitioner of any changes that could affect herd biosecurity.

Keeping track of your herd's progress in Herdsure®

An **annual herd progress report** will be issued to Herdsure® members. The progress report will detail the level achieved for each protocol for which the herd is enrolled on the date of issue.

For a small fee, an updated progress report can be produced. The updated progress report, like the annual report, will detail the level achieved for each protocol for which the herd is enrolled on the date of issue.

Adding cattle – avoiding buying in disease

Added cattle are one of the most likely ways to introduce IBR into a herd. Minimising the number of cattle added to the herd from other sources reduces the risk of introducing infection.

The Herdsure® service recommends that all added animals are isolated and tested before joining the herd. Testing and isolation of added animals is mandatory for herds seeking CHeCS accreditation. The only exception to this is where animals are sourced from CHeCS disease-free certificated herds. Refer to the CHeCS technical document for the rules that apply.

It is wise to establish the IBR history of the herd of origin of cattle intended for purchase in order to avoid buying cattle from a herd with IBR infection.

It is preferable to test cattle intended to be introduced into the herd while they are still with the herd of origin so that antibody-positive animals may be identified and rejected. Herds vaccinated with marker vaccine should be identified by the veterinary practitioner when submitting blood samples to AHVLA as a different test will be used on these samples.

Establishment of new herd from accredited stock

Where it is intended to establish an IBR-free CHeCS-accredited herd by acquiring cattle accredited free of IBR, the premises must be inspected by your veterinary practitioner before the new stock is introduced in order to ensure that the biosecurity of the premises and farm boundaries meet the requirements of CHeCS. Accreditation testing for IBR must be carried out no sooner than three months after establishing the herd. Once testing has been completed, with satisfactory results, the herd can be recognised as having achieved accredited status.

Shows and sales

Contact with other stock puts the status of the herd at risk. CHeCS-accredited cattle attending CHeCS-accredited sections may return to their herds of origin without isolation and testing. All other cattle will lose their Herdsure® health status. Consequently, on returning to their herd of origin, they will be subject to the testing and isolation requirements described above. For CHeCS-accredited herds, animals moving off the owner's holding for preparation for sale will lose accredited status if the CHeCS biosecurity rules are not adhered to on the premises where preparation is taking place.

Adding cattle of unknown or lower health status

All added cattle must be moved directly into an isolation facility. They should be tested immediately after movement into isolation to allow rapid identification and removal of any positive cattle, thus reducing the period in isolation.

After a period of 28 days of isolation, the added cattle must be tested for antibody. Cattle showing negative results may be introduced into the herd. If cattle are bought in consignments of more than one animal and any positive animals are disclosed at testing, they must be removed and the remaining negative animals must go through another period of 28 days of isolation starting after the removal of the positive cattle. After the period of 28 days of isolation the animals should be re-tested.

Very occasionally cattle with latent infection may show negative antibody results but may still be infected. Therefore all bought-in cattle that are 12 months of age or over must also be tested by the appropriate test (depending on whether or not they are vaccinated with marker vaccine) 12 months and 24 months after their introduction into the herd. Cattle bought in under the age of 12 months will require negative ELISA results for the samples collected at isolation only.

Where cattle show positive ELISA results while in isolation

Any cattle testing positive should be removed from the holding without delay. Bedding and waste from the isolation facility must not be disposed of onto pasture that will be grazed by cattle within 12 months. Isolation facilities should be thoroughly cleaned and disinfected.

The protocol

Level 1

Objective of Herdsure® testing

- Level 1 testing aims to establish whether or not there is evidence of IBR infection in a herd.
- Level 1 also uses any herd history and history of relevant test results already held by the veterinary practitioner or by AHVLA, covering the preceding 12 months.
- Where the history and test results indicate clear evidence of IBR in the herd in the last 12 months, herds should enter the protocol at Level 2.

Sampling

To make an assessment of the IBR status of a herd, milking cows, suckler cows, breeding bulls and cattle that are more than 12 months old will be tested for antibody.

For milking cows this can be done using a bulk milk sample. A sample from every bulk tank should be collected. If the level of antibody to IBR in milk is below a defined level we can be confident that the milking cows have not been exposed to IBR virus recently.

The milk antibody test cannot distinguish antibody produced in response to vaccination from antibody produced in response to infection. Therefore, if marker vaccine has been used in the milking cows, blood samples from a proportion of the cows in the milking herd will be collected. Blood samples from suckler cows, cattle over 12 months old and breeding bulls will also be collected.

How many to sample?

The number of cattle to sample in each management group can be calculated to determine whether the virus has been circulating in that group.

The number of cattle sampled for the milking cow herd, the suckler cow herd and for each management group of youngstock depends on the size of the group. Your veterinary practitioner has been provided with a table to calculate this. Breeding bulls are sampled individually. Your veterinary practitioner will also be able to tell you the criteria for deciding whether or not particular groups of cattle should be considered as separate management groups or not.

When the Level 1 sampling and testing has been completed the herd can progress to Level 2. Herds may also arrive at Level 2 directly when herd history and recent diagnostic test results indicate conclusively the presence of IBR infection. The veterinary practitioner, in consultation with a Herdsure® consultant, will be able to decide if this is the case.

Level 2

Objective of Herdsure® testing

- Level 2 testing aims to improve the health status of the herd by reducing the detrimental influence of IBR infection in the herd. This is achieved by identifying the cattle that are responsible for the maintenance of the infection. Once identified, these cattle may be removed or they may be retained and a disease-reduction strategy applied.

At this point a decision should be made as to which of two options to follow:

- **Level 2a** to test and remove all ELISA-positive cattle from the herd
- **Level 2b** to maintain the immunity of the herd by the use of marker vaccine while the number of cattle showing antibody to the disease strain of IBR virus decreases. At the same time, the regular testing provides monitoring for evidence of the introduction of new infections.

Herds seeking CHeCS accreditation must ultimately follow Level 2a, although they may start with Level 2b and change at a later date, if appropriate.

Biosecurity

A comprehensive biosecurity policy, based on advice provided by your veterinary practitioner, should be adopted and reviewed by the farmer and veterinary practitioner on an annual basis.

Investigation of clinical disease

Any episodes of clinical disease thought to be associated with IBR infection should be reported to your veterinary practitioner who will arrange collection of appropriate samples for diagnostic purposes.

Sampling

Level 2a

Successful completion of Level 2a requires blood sampling of all the milking and suckler cows, all the cattle over 12 months old and all the breeding bulls. Only when no cattle positive to the IBR antibody test are detected on two successive occasions at an interval of no less than 1 month and no more than 12 months can the herd move to Level 3.

Level 2b

Annual statistically significant blood sampling of milking cows, suckler cows and youngstock groups between 8 and 11 months old and individual sampling of breeding bulls is carried out for Level 2b.

Test results will be reviewed annually by the veterinary practitioner together with a Herdsure® consultant and, if thought necessary, a decision on the strategy for the following year can be made. At any time the option to change to Level 2a can be chosen. The Level 2a route is required for herds seeking CHeCS accreditation.

Level 3

Objective of Herdsure® testing

- Level 3 testing aims to monitor and maintain the improved health status of the herd. The sampling and testing is designed to provide assurance that IBR is not present in the herd and to alert the veterinary practitioner if IBR is re-introduced into the herd.

Biosecurity

A comprehensive biosecurity policy, based on advice provided by your veterinary practitioner, should be adopted and reviewed by the farmer and veterinary practitioner on an annual basis.

Investigation of clinical disease

Any episodes of clinical disease thought to be associated with IBR infection should be reported to your veterinary practitioner who will arrange collection of appropriate samples for diagnostic purposes.

Sampling

During Level 3 the same procedures as described for Level 1 are used to monitor the antibody-negative herd for the appearance of positive antibody results, which would indicate the introduction of infection into the herd.

The bulk milk ELISA testing begins 3 months after a herd enters Level 3 and continues at 3-monthly intervals. Where milking cows are marker-vaccinated, the bulk milk test will be replaced by sampling a defined proportion of the milking cows starting 1 year after the herd enters into Level 3. The sampling of suckler cows and youngstock also begins 1 year after the herd enters Level 3 and continues annually thereafter.

The number of cattle sampled for the milking cow herd, the suckler cow herd and for each management group of youngstock again depends on the size of the group. Your veterinary practitioner will calculate this using the same method used for Level 1. Breeding bulls and bought-in animals from non-accredited herds will be sampled individually. For herds with CHeCS accreditation, annual blood sampling of **all** marker-vaccinated animals is required.

Where any of the Level 3 tests show positive antibody results, the herd will revert to Level 2.

CHeCS accreditation

The Level 2a route is required for CHeCS accreditation. Herds are eligible for CHeCS accreditation at Level 3 following 2 consecutive clear herd tests at Level 2a.