

# Herdsure<sup>®</sup> protocol for infectious bovine rhinotracheitis (IBR) in cattle herds

## Herdsure<sup>®</sup> Chapter 5



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## 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.

IBR is a widespread and significant disease of cattle, manifesting itself in a wide range of clinical signs and syndromes. This protocol does not address the management and treatment of individual cases of clinical IBR; rather, it addresses the control of active IBR infection which leads to the expression of those syndromes.

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

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

## The disease

### Introduction

Infectious bovine rhinotracheitis (IBR) is caused by bovine herpes virus 1. The virus primarily causes respiratory disease and infected cattle can harbour the virus 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.

### Impact of the disease

IBR infection can result in a spectrum of clinical signs from severe, fatal disease to mild or even sub-clinical infection. Although outbreaks of disease can occur in cattle of all ages, IBR is the most common cause of respiratory disease in cattle of 12 to 18 months of age. The disease is also commonly seen in young adult dairy cattle after introduction to the milking herd.

### Sources of infection

IBR is spread by close contact between cattle either through nose-to-nose contact or by natural mating in the case of Infectious Pustular Vulvo-Vaginitis and Infectious Pustular Balano-Posthitis (IPVV/IPB). 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 even while not showing any clinical signs. Latently infected cattle nearly always have antibody to IBR so they can be detected using serological tests. Latent infection is the primary way by which IBR persists in a herd.

Spread between herds is frequently as 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 the use of shared equipment or personnel moving between farms, although the virus can only survive a few days in the environment and it is susceptible to disinfectants. Theoretically, infection could also be introduced to a herd by the purchase of semen for artificial insemination (AI), but the stringent controls and tests on AI studs makes this route of infection extremely unlikely.

## **Disease syndromes associated with IBR infection**

### ***Respiratory disease***

IBR most frequently affects the upper respiratory tract and causes a raised temperature, increased respiratory rate and discharges from the eyes and nostrils that are initially clear but become cloudy or white. There may be a painful conjunctivitis and obvious reddening of the lining of the nostrils, which has led to the term 'red nose' being used to describe outbreaks in the USA. If there is extensive damage to the tracheal mucosa, it can cause severe breathing difficulty and lead to asphyxia or fatal pneumonia from secondary bacterial infection.

### ***Reproductive disease***

IBR can also cause reproductive disease. It can cause abortion at any stage of gestation and this may follow an outbreak of IBR with clinical signs or where infection was not apparent. Abortion can occur shortly, or up to 3 months, after infection. This manifestation of the disease is not common in Great Britain.

When IBR is spread by natural service, it results in inflammation of the penis or vulva and formation of pustules on the mucosa. There may be an odourless discharge and it may be painful. The infection of cows is known as Infectious Pustular Vulvo-Vaginitis (IPVV) and of bulls as Infectious Pustular Balano-Posthitis (IPB). These are uncommon manifestations of IBR infection in herds in the UK.

### ***Rapidly fatal disease in young calves***

Rarely, IBR can cause severe and rapidly fatal disease in very young calves.

### ***Production loss***

IBR contributes to loss of production by causing death and longer finishing times in growing cattle and by causing decreased milk production, abortion and deaths in adult cattle.

### ***Infection without clinical signs***

Sometimes spread of IBR has been detected 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.

## **Diagnosis**

Diagnosis is by competitive gB ELISA of individual sera (TC0675) and indirect ELISA of bulk milk (TC0124), to detect antibody to IBR. These ELISA tests detect antibody to both field and vaccinal strains of the IBR virus.

The gE ELISA (TC0680, for individual sera only) detects exposure to field strains of the virus only.

## Control of IBR

Introduction of disease to a herd can be prevented by the application of appropriate biosecurity measures.

Cattle with antibodies to IBR are likely to be latently infected and able to spread infection to other cattle. IBR infection can be eliminated from a herd by repeated testing and removal of all the antibody-positive cattle.

This 'test and cull' route has been successful in many countries. However, one complication has become apparent during the application of IBR control programmes: A small proportion of latently infected cattle do not have antibody to IBR. These latently infected cattle are not detectable by serological tests so are not removed and may potentially spread disease. This can delay the eradication of infection from a herd but, despite this delay, the test and cull approach has been shown to result in eventual eradication of IBR from the herd.

### **Vaccination**

If a large proportion of the herd is infected, the test and cull route is often 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. 'Marker vaccines' have been developed allowing a specific antibody test to be used 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.

## Testing for the disease

- All blood samples for Levels 1, 2 and 3 of the IBR protocol should be clearly identified and referenced to the ear tag number of the animal of origin.
- All blood samples for IBR testing should be collected in plain (red top) blood tubes.
- Definitions of age and type of cattle referred to in this protocol are explained in the section on service instructions on page 18 of this handbook, as is the definition of the 'herd' for registration purposes.

Infection of an animal by IBR virus produces an antibody response that can be detected in a blood or milk sample. Detection of antibody is by the ELISA test. 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.

The following tests are used in this protocol:

TC0124	Indirect ELISA test for IBR antibodies in bulk milk samples
TC0675	Competitive ELISA test for IBR gB antibodies in individual serum samples
TC0680	Blocking ELISA test for IBR gE antibodies in individual serum samples for animals vaccinated with gE-deleted marker vaccine

### Bulk milk IBR antibody test – TC0124

This is an indirect ELISA test for the detection of IBR antibody in milk.

#### *Interpretation*

Category	OD ratio	IBR interpretation/action: brief guide
Negative	<0.10	<b>Naïve/unvaccinated</b>
Low positive	0.10–0.40	Some sero-positive cows but <b>extensive active infection unlikely</b>
Mid positive	>0.40–0.70	Situation less clear
High positive	>0.70	<b>Heavily infected/vaccinated.</b> Significant virus circulation likely due to reactivation and re-excretion of latent infection. Clinical recrudescence may occur sporadically in unvaccinated herds

### Blood IBR antibody test – TC0675

This is a competitive ELISA (cELISA) for gB antibodies that is used as a screening test to detect the serological status of an animal. This test is used primarily to ascertain the presence or absence of antibody rather than to quantify the level of antibody.

#### *Interpretation*

The cELISA is the preferred test for individual sera to distinguish between sero-positive and sero-negative status. The cELISA is the most suitable test for monitoring IBR status. Results are reported as either positive or negative.



## Blood IBR antibody test (marker vaccine) – TC0680

The IBR gE ELISA test is used to test individual animals that have been vaccinated using an IBR gE-deleted marker vaccine to determine if the animals have been exposed to field virus.

### *Interpretation*

For animals vaccinated with an IBR gE-deleted marker vaccine:

- those that **have not** been exposed to field strains of IBR or vaccinated with a non-marker vaccine will be detected as **negative** on the IBR gE ELISA
- those that **have** been exposed to field strains of IBR and/or vaccinated with a non-marker vaccine will be detected as **positive** on the IBR gE ELISA.

## 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.

- **Movements 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.
- **Persons entering premises** to handle the cattle (or their products) should wear protective clothing and footwear. These must be clean and disinfected before and after the contact with the cattle. Alternatively, disposable protective clothing should 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 use by herds subscribed to Levels 2 and 3 of Herdsure® 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. The driver should remain in the vehicle cab and should not assist in removing cattle from pens unless 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 use.
- **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 the farm’s cattle and any neighbouring cattle is essential.

- **Contact with cattle of different health status:** Cattle herds subscribed to Levels 2 and 3 of Herdsure® IBR must not come into contact with cattle from herds that 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. (See procedures for buying in cattle at the end of the protocol section.)
- **Added animals** are particularly high risk sources of new infection - see section on 'Added animals' below.
- **Isolation period:** All cattle entering the herd should be isolated for 4 weeks and appropriate testing carried out (see section on buying in cattle at the end of the protocol). 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.
- **Isolation facilities** that prevent 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 after all cattle in the isolation facility have passed all the required tests and have been added to the herd. If bought-in cattle are positive, dung must not be disposed of onto pasture that is to be grazed by cattle within 12 months.
- **Notification:** Herd owners and managers who are participating in Herdsure® must inform the supervising veterinary practitioner of any changes that could affect herd biosecurity.
- **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.

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.

## 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.

## The protocol

### Level 1



#### 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 utilises any herd history and history of relevant test results already held by the veterinary practitioner or by AHVLA.

If active infection is present it is assumed that 10% of the adult cattle and 10% of the youngstock will have sero-converted to IBR.

#### Level 1: Sampling, testing and interpretation protocol

Also refer to the flowchart summary of the protocol at the end of Level 3.

1.1	Where appropriate laboratory test results indicate evidence of IBR in the herd from the previous 12 months, the herd should enter at Level 2.
1.2	Before commencing on Level 1, the veterinary practitioner must inform the Herdsure® helpline whether marker vaccine is in use in the herd. This will enable the team to set the herd up on the correct route through the protocol, with the appropriate choice of tests at each stage.
1.3	Differentiation between non-marker vaccine antibody and field infection antibody is not possible, so herds vaccinated with non-marker vaccine are addressed in the same way as infected herds for the purposes of this protocol and will join the programme at Level 2.
1.4	For herds with no vaccination history, and for which previous test results are not available, samples will be collected according to the instructions provided below.
1.5	<p><b>Dairy herds that have not used marker vaccine</b></p> <p>  A bulk milk tank sample should be submitted and will be examined for antibody. Avoid sampling when less than 75% of the cows are lactating. The collection bottle will contain preservative (e.g. Bronopol). Results will be reported as either negative or positive with the OD ratio included in the report.</p> <ul style="list-style-type: none"> <li>Herds receiving a positive result proceed directly to Level 2.</li> <li>Herds receiving a negative result proceed to paragraph 1.7 below if they contain suckler cows or to paragraph 1.8 if they do not.</li> </ul>

<p><b>1.6</b></p>  	<p><b>Dairy herds that have used marker vaccine</b></p> <p>These herds should have the IBR status of their milking herd determined by blood sampling a statistically significant number of the milking cows. This number can be determined from Table 4 below. The samples will be tested with the gE ELISA to identify antibody produced in response to challenge with a field strain of virus or a conventional vaccine, as opposed to antibody produced in response to a gE-deleted marker vaccine.</p> <p>Results will be reported as either negative or positive.</p> <ul style="list-style-type: none"> <li>■ Herds receiving a positive result proceed directly to Level 2.</li> <li>■ Herds receiving a negative result proceed to paragraph 1.7 if they contain suckler cows or to paragraph 1.8 if they do not.</li> </ul>
<p><b>1.7</b></p>  	<p><b>Beef suckler herds</b></p> <p>Where beef suckler cows and dairy cows are present, the dairy cows should be sampled as in paragraphs 1.5 and 1.6 above and the suckler cows as described here.</p> <p>Blood samples should be collected from a statistically significant sample of the adult suckler cows for IBR antibody (by gB ELISA (TC0675) if they have not been vaccinated or gE ELISA (TC0680) if they have been vaccinated with a marker vaccine). Refer to Table 4 below to calculate the number of animals to sample according to the group size.</p> <p>Herds vaccinated with marker vaccine should be identified as such on the submission form. Results will be reported as either negative or positive.</p> <ul style="list-style-type: none"> <li>■ Herds receiving a positive result proceed to Level 2.</li> <li>■ Herds receiving a negative result proceed to paragraph 1.8.</li> </ul>
<p><b>1.8</b></p>  	<p><b>All herds that are negative to this point</b> will now need to carry out statistically significant blood sampling of all distinct management groups of youngstock over 12 months of age. See the section below for a definition of a management group and Table 4 showing the number of animals to sample.</p> <p>Individual blood samples from all breeding bulls are also required.</p> <p>Results will be reported as either negative or positive.</p>
<p><b>1.9</b></p>	<p>When Level 1 has been completed, the results will enable a decision to be made as to whether the herd follows route <b>2a</b> or route <b>2b</b> at Level 2.</p> <p>A herd will be designated as <b>sero-positive</b> at Level 1 if any bulk milk ELISA or blood sample is positive. Herds will be designated as <b>sero-negative</b> if all samples tested are negative.</p>

## Statistically significant sampling of management groups

A single management group is considered to be a group of cattle grazing the same piece of land.

If the cattle are housed, then each group should be considered as a separate management group unless there is contact between them that would result in the spread of IBR between the groups. In this case, the groups sharing the same air space should be considered as a single management group.

The number of animals shown in Table 4 should be tested.

**Table 4: Statistical-based sampling according to group size**

Group size	Animals to sample
10	10
20	19
30	24
40	28
50	31
70	34
100	38
150	40
200	42
300	43
500	45
800	45

\*For values that fall between those in the table use the next highest figure in the table or all the animals in the group, whichever is lower.

## Level 2




### 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 done by identifying the cattle that are responsible for the maintenance of infection. Once identified, these cattle may be removed or they may be retained and a disease reduction strategy applied.





### Level 2: Sampling, testing and interpretation protocol

The sampling and testing protocol at Level 2 follows a sequence determined by the results of each test.

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

<b>2.1</b>	<p>Two routes are available through Level 2:</p> <ul style="list-style-type: none"> <li>■ Level 2a aims to establish an entirely serologically negative herd – the ‘sero-negative’ route.</li> <li>■ Level 2b aims to maintain and monitor the immunity of the herd – the ‘sero-positive’ or ‘maintained immunity’ route.</li> </ul> <p>The farmer and veterinary practitioner should decide which route is the most appropriate for the herd and inform the Herdsure® helpline. This will enable AHVLA to offer the appropriate reminders as Level 2 progresses. Herds seeking CHeCS accreditation must ultimately follow Level 2a, although they may start with Level 2b and change at a later date, if appropriate.</p>
<b>2.2</b>	<p>Level 2 testing is also influenced by the use of marker vaccine. For herds that entered at Level 1, information on whether this is used will already have been supplied and thus the choice of Level 2 tests will be automatic. For herds that join at Level 2, this information will need to be supplied now, to ensure the correct testing is allocated by the Herdsure® Management System.</p>
<b>2.3</b> 	<p>A comprehensive biosecurity policy, based on advice provided in the ‘Biosecurity’ section above, should be adopted and reviewed by the farmer and veterinary practitioner on an annual basis.</p>
<b>Level 2a: sero-negative route</b>	
<b>2.4</b>  	<p>All animals aged over 12 months old must be blood sampled together with any younger animals which are not home-bred.</p> <p>Samples will be examined for IBR antibody (by gB ELISA if they have not been vaccinated or gE ELISA if they have been vaccinated with a marker vaccine).</p> <p>Serologically positive animals must be removed from the herd.</p> <p>Further blood sampling at intervals of no less than 1 month and no more</p>

	than 12 months should be carried out until no more sero-positive animals are detected.
<b>2.5</b>	The herd will remain at Level 2a until two clear herd tests, no less than 1 month and no more than 12 months apart, are achieved. The herd can then move to Level 3. The herd also qualifies for CHeCS accreditation on reaching this point.
<b>2.6</b>	All incidents of disease in which clinical signs consistent with IBR infection, as detailed, must be investigated. Appropriate samples should be sent to the local AHVLA laboratory for diagnostic testing, using the General Submission Form (VLA 3). Diagnostic testing is not done within Herdsure® – see section on ‘Additional testing of cattle from Herdsure® herds’ on page 21. Any confirmed or suspected cases of IBR should be discussed with a Herdsure® consultant.
<b>2.7</b>	In addition to the action at paragraph 2.6, the revelation of further sero-positive cows in an unvaccinated herd or a marker-vaccinated herd during the course of testing should be regarded as an indication of active infection. In this event, a decision should be made as to whether to proceed with the sero-negative route of Level 2a or to change to Level 2b (i.e. vaccinate and monitor the herd).  Any requirement to change from Level 2a to Level 2b or vice versa should be notified to the Herdsure® consultant by telephoning the Herdsure® helpline.
<b>Level 2b – sero-positive or maintained immunity route</b>	
<b>2.8</b>	Level 2b requires implementation of a control and monitoring policy for IBR. Advice on control of the disease has been given earlier in the ‘disease’ section of this protocol.  Investigations must be carried out whenever there is an episode of disease with clinical signs consistent with possible IBR infection (see ‘disease’ section).
<b>2.9</b>	<b>Herds with milking cows</b>   Where marker vaccine <b>is not</b> used, the milking cows will be tested for antibody by 3-monthly testing of bulk milk samples by ELISA.  Where marker vaccine <b>is used</b> in the herd, statistically significant blood sampling of milking cows (see Table 4 at Level 1 for sampling numbers) to monitor serological status of the herd will be carried out <b>annually</b> . Samples will be tested by gE ELISA.

<p><b>2.10</b></p>  	<p><b>Beef suckler herds</b></p> <p>Where beef suckler cows and dairy cows are present, the dairy cows should be sampled as in paragraph 2.9 above and the suckler cows as described here.</p> <p>Statistically significant blood sampling of adult suckler cows should be carried out <b>annually</b> to monitor the serological status of the herd. (See Table 4 in Level 1 for the number to be sampled.)</p>
<p><b>2.11</b></p>  	<p><b>For all herds</b></p> <p>Annual statistically significant sampling should be carried out for each management group of youngstock between 8 and 11 months of age. (Refer to Table 4 in Level 1 for the sample size.) For marker-vaccinated herds the gE ELISA will be used; otherwise the gB ELISA will be used. At this time all breeding bulls should be sampled.</p>
<p><b>2.12</b></p>	<p>Over a period of time, the antibody levels disclosed at the 3-monthly bulk milk tests and the number of sero-positive cattle disclosed at the annual test should decrease. Indeed the herd may eventually become serologically negative to field virus. At any stage the client and veterinary practitioner may wish to consider moving to the sero-negative route (Level 2a). The Level 2a route is required for herds seeking CHeCS accreditation.</p>
<p><b>2.13</b></p>	<p>If an increase in milk antibody or an increase in the proportion of sero-positive cattle is seen, this may indicate the introduction of active infection. Evidence may be revealed as:</p> <ul style="list-style-type: none"> <li>■ a diagnosis of IBR through investigating clinical disease consistent with IBR</li> <li>■ the disclosure of an increase in bulk milk antibody ratio by more than 0.2 OD units between consecutive quarterly samples</li> <li>■ the disclosure of an increase of 10% or greater in the number of cattle showing positive results at the annual statistically significant sampling visit</li> <li>■ the disclosure of an increase of 10% or greater in the number of cattle showing positive results at the annual statistically significant sampling visit of the 8- to 11-month-old management groups.</li> </ul> <p>If the herd in question is unvaccinated, vaccination may be considered. Any change in vaccination status should be notified to the Herdsure® helpline as this will affect the allocation of future tests.</p>
<p><b>2.14</b></p>	<p>Implementation of effective disease reduction strategies must be demonstrated by up-to-date records of investigations of suspect clinical cases, as outlined by the veterinary practitioner.</p>







## Level 3

### 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.

### Level 3: Sampling, testing and interpretation protocol

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

<b>3.1</b>	All episodes of disease in which clinical signs are consistent with IBR infection, as detailed by the veterinary practitioner, must be investigated.
<b>3.2</b>	A comprehensive biosecurity policy should be maintained, based on advice provided in this handbook. This should be reviewed by the farmer and veterinary practitioner on an annual basis.
<b>3.3</b>  	<p><b>Herds with milking cows</b></p> <p>Quarterly monitoring of bulk milk samples should be carried out, starting 3 months after entry into Level 3. Bulk milk samples will be tested by ELISA.</p> <p>For marker-vaccinated herds, annual statistically significant blood sampling of the milking herd should be carried out. (Refer to Table 4 in Level 1 for the number of cattle to be sampled.) For marker-vaccinated herds with CHeCS accreditation, annual blood sampling of <b>all</b> marker-vaccinated animals is required. This sampling should begin 1 year after entry into Level 3; samples will be examined by the gE ELISA.</p>
<b>3.4</b>  	<p><b>Beef suckler herds</b></p> <p>Where beef suckler cows and dairy cows are present, the dairy cows should be sampled as in paragraph 3.3 above and the suckler cows as described here.</p> <p>Annual statistically significant blood sampling, starting 1 year after successful completion of Level 2, of suckler cows should be carried out. (Refer to Table 4 in Level 1 for the number of cattle to be sampled.) For marker-vaccinated herds with CHeCS accreditation, annual blood sampling of <b>all</b> marker-vaccinated animals is required.</p> <p>Samples will be examined for IBR antibody (by indirect ELISA if they have not been vaccinated or gE ELISA if they have been vaccinated with a marker vaccine).</p>

**3.5****All herds**

**Annual** statistically significant blood sampling must be carried out, starting 1 year after successful completion of Level 2. Sampling needs to include each management group containing animals that are 12 months or older. (Refer to Table 4 in Level 1 for the number of cattle in each management group to be sampled.)

All breeding bulls, bought-in animals from non-accredited herds and all marker-vaccinated animals must be sampled individually.

Where any positive samples are revealed as a result of testing of any milk or blood sampling at Level 3, the herd will revert to Level 2a or 2b depending on the decision of the veterinary practitioner and farmer.

Where a herd reverts to Level 2, the Herdsure® consultant must be informed (via the Herdsure® helpline) whether the herd will re-enter at Level 2a or 2b.

## CHeCS accreditation

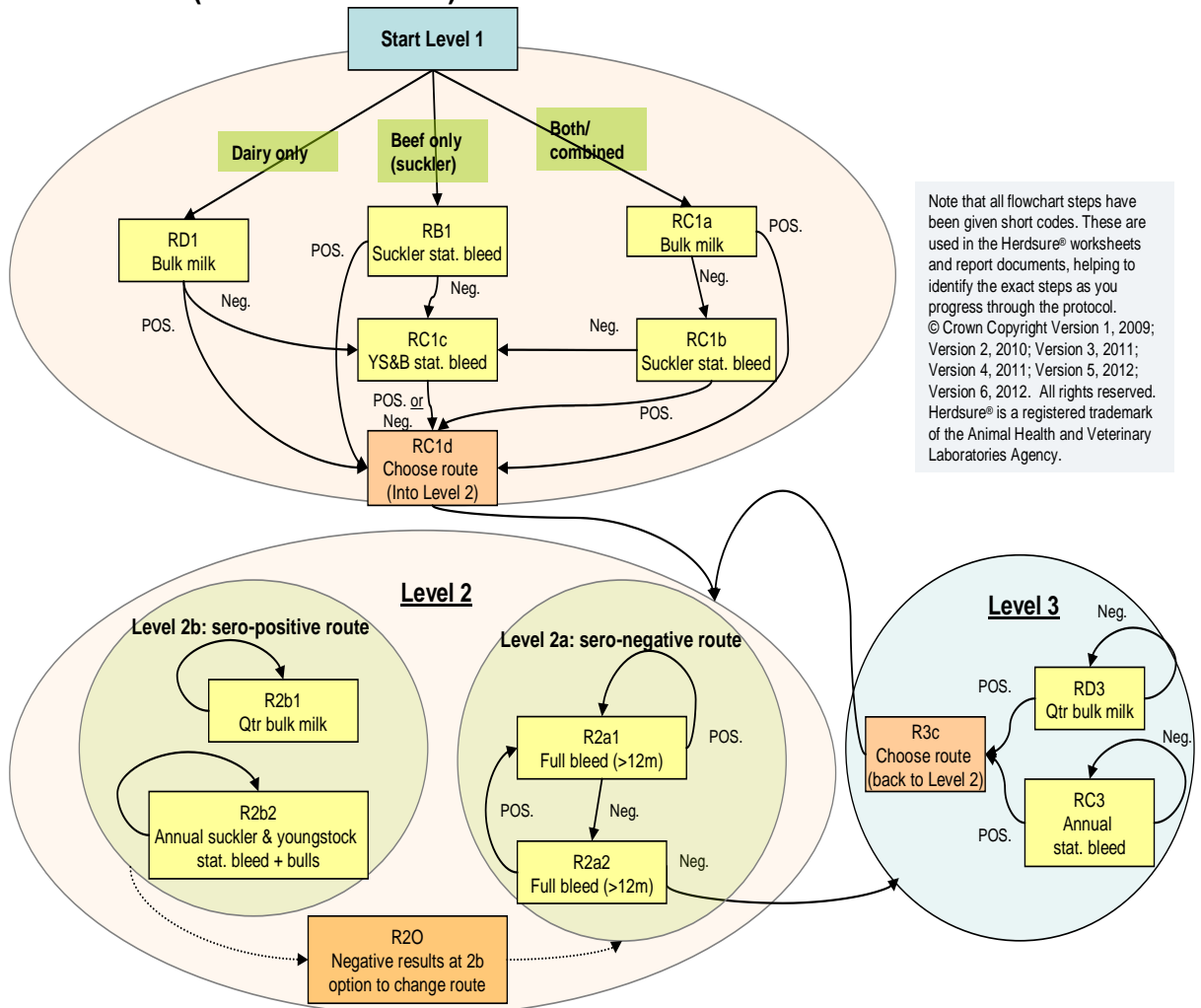
The Level 2a route is required for CHeCS accreditation. Herds are eligible for CHeCS accreditation at Level 3 following 2 consecutive clear herd tests at Level 2a. More information is available on the CHeCS website ([www.checs.co.uk](http://www.checs.co.uk)).

## Key to flowchart summary of the Herdsure® protocol for IBR – standard version

Step	Step name	
<b>RB1</b>	Suckler cow statistical blood sampling	This is a statistically significant bleed of suckler cows, with testing using TC0675. Ear tag details for animals over 2 years of age will be provided.
<b>RD1</b>	Dairy bulk milk	This is a bulk milk test for antibody, using TC0124.
<b>RC1a</b>	Combined bulk milk	For combined dairy/beef farms, this bulk milk test (TC0124) is designed to be followed (if negative) by a statistically significant bleed of suckler cows.
<b>RC1b</b>	Suckler cow statistical blood sampling	This statistically significant bleed of suckler cows, using TC0675, is designed to follow on from the bulk milk test in combined beef/dairy herds. Ear tag details are provided.
<b>RC1c</b>	Statistical sampling of youngstock and individual sampling of breeding bulls	A statistically significant bleed of all management groups of youngstock over 12 months of age, together with individual blood samples from all breeding bulls using TC0675. A list of ear tags of animals over 12 months of age is provided.
<b>RC1d</b>	Choose route	The customer chooses the route that best reflects their requirements.
<b>R2a1</b>	Full bleed over 12 months	This is the first of two blood samplings of all animals over 12 months of age, for testing by TC0675.
<b>R2a2</b>	Full bleed following a negative full bleed (over 12 months)	This is the second blood sampling of animals over 12 months of age, and follows a negative result for the earlier bleed. It can occur between 1 and 12 months following the first bleed.
<b>R2b1</b>	Quarterly bulk milk	A bulk milk sample is taken for TC0124.
<b>R2b2</b>	Suckler cows, youngstock and breeding bulls statistical bleed	Statistically significant blood sampling of suckler cows and management groups of youngstock between 8 and 11 months of age. Also individual samples for all breeding bulls. Ear tag details are provided. This step is repeated annually until the herd progresses to a suitable stage to enter Level 2a.
<b>R2O</b>	Level 2 option to change route	Herds in Level 2b that are reported negative will be given the option to change to Level 2a. Changing the route at Level 2 can also be requested due to other circumstances, for example a breakdown in Level 2a.
<b>RC3</b>	Annual statistical bleed to include bought-in animals but not dairy cows.	Statistically significant blood sampling of each management group over 12 months of age to include suckler cows but excluding dairy cows. Breeding bulls should be sampled individually, as should all bought-in animals from non-accredited herds. A list of ear tags is provided.
<b>RD3</b>	Level 3 bulk milk monitoring	This step is bulk milk antibody testing by TC0124.
<b>R3c</b>	Choose route	If a positive result occurs in Level 3, the herd reverts to one of the two routes through Level 2. The customer chooses the route that best reflects their requirements.

## Flowchart summary of the HerdSure® protocol for IBR – standard version

### Infectious bovine rhinotracheitis (IBR) – standard version (no marker vaccine)



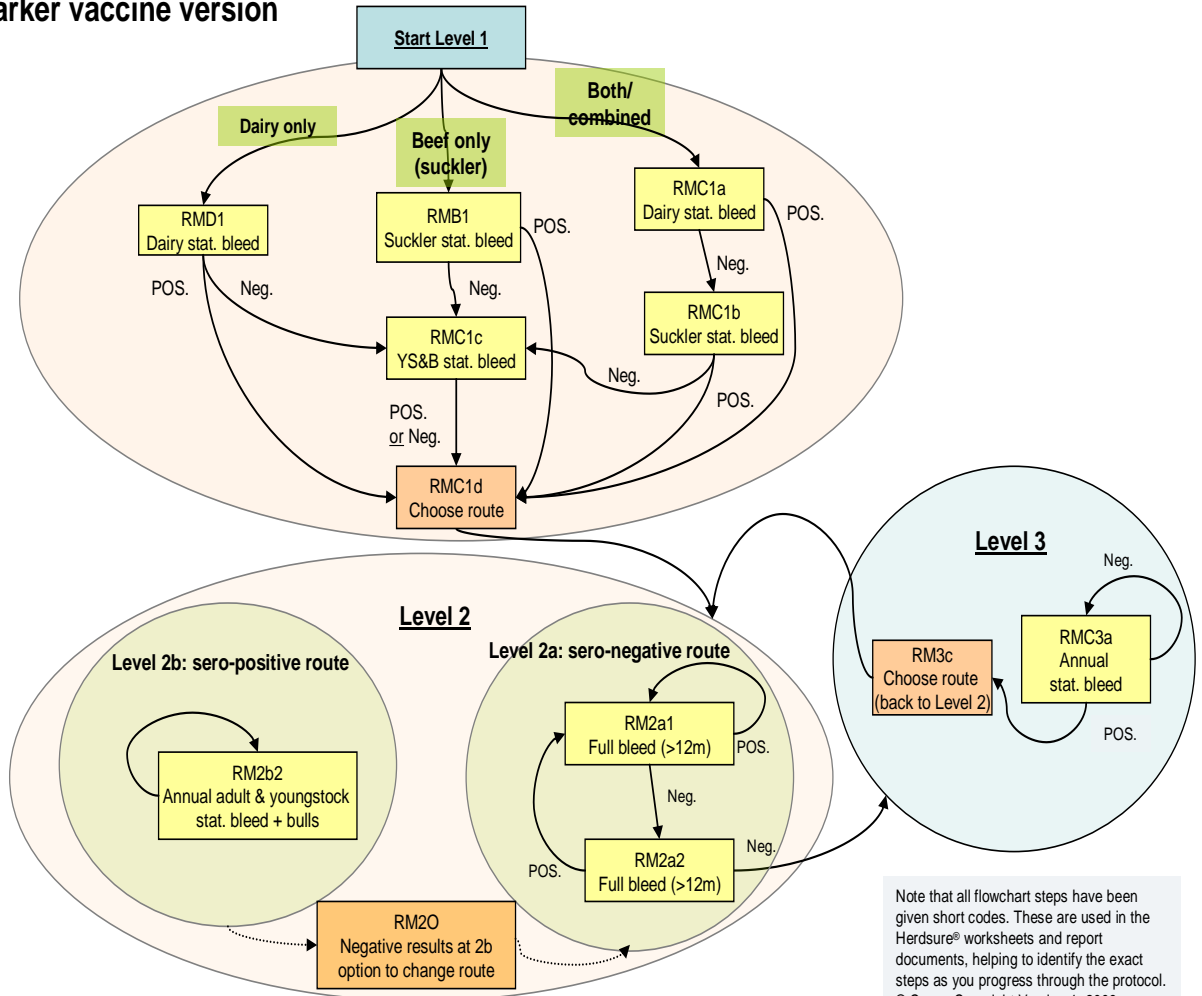
Note that all flowchart steps have been given short codes. These are used in the HerdSure® worksheets and report documents, helping to identify the exact steps as you progress through the protocol. © Crown Copyright Version 1, 2009; Version 2, 2010; Version 3, 2011; Version 4, 2011; Version 5, 2012; Version 6, 2012. All rights reserved. HerdSure® is a registered trademark of the Animal Health and Veterinary Laboratories Agency.

## Key to flowchart summary of the Herdsure® protocol for IBR – marker vaccine version

Step	Step name	
<b>RMB1</b>	Suckler cow statistical blood sampling	A statistically significant bleed (for TC0680), designed for a solely suckler herd. Ear tag details are provided.
<b>RMD1</b>	Dairy cow statistical blood sampling	A statistically significant bleed (for TC0680) of the dairy herd. Ear tag details are provided.
<b>RMC1a</b>	Combined dairy statistical bleed	For combined dairy/beef farms. This statistically significant bleed (for TC0680) of dairy animals is designed to be followed (if negative) by a suckler bleed. Ear tag details are provided.
<b>RMC1b</b>	Suckler cow statistical blood sampling	For combined dairy/beef farms. This statistically significant bleed (for TC0680) follows a negative dairy bleed. Ear tag details are provided.
<b>RMC1c</b>	Statistical sampling of youngstock and individual sampling of breeding bulls	A statistically significant bleed of all management groups of youngstock over 12 months of age, together with individual blood samples from all breeding bulls using TC0680. A list of ear tags of animals over 12 months of age is provided.
<b>RMC1d</b>	Choose route	The customer chooses the route that best reflects their requirements.
<b>RM2a1</b>	Full bleed over 12 months	This is the first of two blood samplings of all animals over 12 months, for testing by TC0680.
<b>RM2a2</b>	Full bleed following a negative full bleed (over 12 months)	This is the second blood sampling of animals over 12 months, and follows a negative result for the earlier bleed. It can occur between 1 and 12 months after the first bleed.
<b>RM2b2</b>	Milking, suckler cows, youngstock and breeding bulls statistical bleed	Statistically significant blood sampling of all milking cows, suckler cows and management groups of youngstock between 8 and 11 months of age. Also individual samples for all breeding bulls using TC0680. Ear tag details are provided. This step is repeated annually until the herd progresses to a suitable stage to enter Level 2a.
<b>RM2O</b>	Level 2 option to change route	Herds in Level 2b that are reported negative will be given the option to change to Level 2a. Changing the route at Level 2 can also be requested due to other circumstances, for example a breakdown in Level 2a.
<b>RMC3</b>	Annual statistical bleed to include bought in animals	Statistically significant blood sampling of each management group over 12 months of age to include suckler cows and dairy cows. Breeding bulls should be sampled individually, as should any bought-in animals from non-accredited herds. For CHeCS-accredited herds all marker-vaccinated animals must be sampled. A list of ear tags is provided.
<b>RM3c</b>	Choose route	If a positive result occurs in Level 3, the herd reverts to one of the two routes through Level 2. The customer chooses the route that best reflects their requirements.

## Flowchart summary of the HerdSure® protocol for IBR – marker vaccine version

### Infectious bovine rhinotracheitis (IBR) – marker vaccine version



Note that all flowchart steps have been given short codes. These are used in the HerdSure® worksheets and report documents, helping to identify the exact steps as you progress through the protocol. © Crown Copyright Version 1, 2009; Version 2, 2010; Version 3, 2011; Version 4, 2011; Version 5, 2012; Version 6, 2012. All rights reserved. HerdSure® is a registered trademark of the Animal Health and Veterinary Laboratories Agency.

## Procedures for added animals

Added cattle are one of the more 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.

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 added to the herd while still within the herd of origin so that antibody positive animals may be identified and rejected. The ELISA antibody test TC0675 for unvaccinated cattle or TC0680 for marker-vaccinated cattle will be used. Herds vaccinated with marker vaccine should be identified as such on the submission form. The 'unscheduled submission form' Form C, in the 'Forms' section at the back of this handbook) should be used.

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.

### Adding cattle of unknown or lower health status

All added cattle must be moved directly into an isolation facility. (See the biosecurity section at the beginning of this protocol for the definition of 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. The ELISA antibody test TC0675 for unvaccinated cattle or TC0680 for vaccinated cattle will be used. Herds vaccinated with marker vaccine should be identified as such on the submission form. Use the 'unscheduled submission form' Form C.

After a period of 28 days of isolation, the added cattle must be tested for antibody to IBR by the appropriate ELISA test. 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 ELISA testing, the positive animal(s) 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 using the ELISA test. Herds vaccinated with marker vaccine should be identified as such on the submission form. The 'unscheduled submission form' Form C should be used.

Very occasionally, cattle with latent infection may show negative ELISA serum antibody results but still be infected. Therefore, all added cattle that are 12 months of age or over must also be tested by the appropriate ELISA test (TC0675 or TC680) 12 months and 24 months after their introduction into the herd. Cattle added under the age of 12 months will require negative ELISA results for the samples collected at isolation only. These tests are in addition to the requirements for other sampling carried out as part of the protocols.

### 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.

## **Establishment of a new herd from accredited stock**

Where it is intended to establish an IBR-free accredited herd by acquiring cattle accredited free of IBR, the premises must be inspected by the veterinary practitioner before the new stock is introduced in order to ascertain 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.