

# Herdsure<sup>®</sup> Cattle Health Improvement Service

## Handbook for Farmers



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## Introduction

### What is the Herdsure® Cattle Health Improvement service?

The Herdsure® Cattle Health Improvement Service provides a means of assessing and improving the health status of dairy and beef cattle. It aims to reduce the cost of disease to your business by improving the health of your cattle.

The service is very user-friendly and straightforward to implement. It is suitable for all types of cattle herd – dairy and beef, commercial and pedigree. It may be used alongside existing health plans without causing you any unnecessary extra record keeping.

### Why use a service developed by AHVLA?

AHVLA has a worldwide reputation for expertise in the diagnosis of diseases in livestock. The Herdsure® programme of testing is designed to provide you with reassurance that the best approach is being taken towards improving the health status of your herd.

The service is based upon up-to-date knowledge and high quality reliable testing. It uses an approach that enables all dairy and beef farmers to know the health status of their herds and to take steps to improve this where necessary.

This sound approach will make the process of testing and monitoring simple and cost effective, with the overall aim of achieving greater economic benefits through improved cattle health. It will help you and your veterinary practitioner work together to achieve this.

### Effective cattle health management

Health management means assessing the impact of disease on your farm and implementing a strategy to reduce it, in partnership with your veterinary practitioner. Effective health management is fundamental to reducing the cost of disease to your farm business. It also has positive benefits for animal welfare.

AHVLA will facilitate health management by offering a comprehensive and supportive health improvement service. Herdsure® enables you, together with your veterinary practitioner, to plan disease control on your farm. It can help you to progress as far along the path towards disease eradication as suits your business.

Accreditation of freedom from disease is not necessarily the priority for many commercial herds. Instead the priority may be disease control and reducing its impact on both animal health and welfare and the profitability of the farm business.

There is also the option to become accredited by Cattle Health Certification Standards (CHeCS).

### Cattle Health Certification Standards UK (CHeCS) accreditation

Herdsure® is licensed by the Cattle Health Certification Standards UK (CHeCS). Farmers

enrolling in Herdshire® have the option to become CHeCS-accredited as being free of disease for bovine viral diarrhoea (BVD), Johne's disease, infectious bovine rhinotracheitis (IBR) and leptospirosis.

You will be eligible to apply for CHeCS accreditation and awarded certificates of health status provided you comply with strict CHeCS biosecurity rules and sample appropriate animals as specified by Herdshire®. You will be asked to fill in Form D (Appendix 2) Accreditation Application & Compliance Declaration, which is also to be signed by your vet. This form should be completed when you join Herdshire® (alongside form B) and should also accompany each sample submission.

Pen/sale cards can also be provided on request for individual animals. There will be a charge for these. Should you wish to apply for these please call the helpline and we will send you an application form. Please note that Herdshire® requires the following notice:

- 6 weeks notice when testing is required.
- 2 weeks notice if testing has already been completed.

otherwise we cannot guarantee they will be sent on time.

## How does the service work?

### Sampling, testing and management protocols

Sampling and management protocols have been developed for each disease covered by the service, using the extensive expertise of AHVLA.

The diseases included are bovine viral diarrhoea (BVD), Johne's disease, liver fluke, leptospirosis, infectious bovine rhinotracheitis (IBR) and neosporosis.

### Three levels of health status

There are three levels of health status within each of the HerdSure® protocols.

We will issue an annual herd progress report. (See Appendix 3 for an example). **It is important that you have carried out testing according to the protocols in order for the report to be issued.**

## Level 1: Establishes the health status of the herd

The sampling and testing described in Level 1 are designed to give an accurate and reliable assessment of the status of each particular disease in the herd.

The outcome will be that a significant amount of the disease either is, or is not, present in the herd. The definition of what is significant varies for each disease and has been determined by scientific and veterinary experts.

Where there is recent documented evidence of a particular disease in the herd, testing at Level 1 will be considered superfluous. In these cases, herds will be advised to start the protocol at Level 2.

## Level 2: Aims to improve the health status of the herd

The sampling, testing and, if appropriate, management actions described in Level 2 are designed to reduce the amount of disease to nothing or to an acceptable level, depending on the disease in question.

For most diseases, there are necessary and important management actions, which are determined by the test results and which are designed to reduce or eliminate the disease. These management actions include providing certain treatments (for example, for liver fluke), vaccination, segregation of certain categories of cattle and, for some diseases, removal of 'positives' through culling.

Your veterinary practitioner is informed of the required management actions through specific advice given in the full protocols in the handbook for veterinary practitioners.

## Level 3: Monitors and aims to maintain the improved health status of the herd

The sampling, testing and, if appropriate, management actions described in Level 3 are designed to maintain the improved, or otherwise satisfactory, health status of the herd.

Herds will be able to move to Level 3 in two ways:

- directly from Level 1, when the results of testing in the Level 1 protocol show no evidence of active disease.
- via Level 2, when sampling and testing carried out at Level 2 has resulted in the removal of active disease.

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.

## Convenient sampling and testing<sup>1</sup>

The protocols are supported by high quality laboratory tests, many of which are subject to third party accreditation by the United Kingdom Accreditation Service (UKAS) operating to the internationally recognised ISO/IEC 17025 standard for laboratory competence. All tests carried out under the Herdsure® service are accredited to this standard unless marked with '†' on reports.

We have developed a novel IT system, the Herdsure® Management System (HMS), which is used in-house to manage customer records and to monitor each herd. It also prompts you and your veterinary practitioner when tests are due and informs you which animals are to be tested. **For this reason it is important that no samples are submitted until you and your veterinary practitioner are prompted to do so.**

### What to expect when sampling is due

If bulk milk or faeces samples are required, AHVLA will contact both you and your veterinary practitioner with a reminder. AHVLA will send you sample submission forms with lists of ear tag numbers of animals to be sampled (see Appendices 5 and 6 for examples) plus postage-paid labels. We use herd data from the British Cattle Movement Service Cattle Tracing Scheme (BCMS CTS) with filtering to include, for example, only cattle of certain age groups.

Ear tags will be presented as text (e.g. UK123456 789123) for use on the farm. The same code will be represented as a barcode for scanning into AHVLA's sample management system, e.g.



Postage-paid labels are provided for you to return the samples to AHVLA.

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<sup>1</sup> Tests are carried out under AHVLA 'Standard Terms and Conditions for Supply of Services'. These are available on request from your local AHVLA Regional Laboratory, from AHVLA Weybridge or on the AHVLA website at [www.defra.gov.uk/AHVLA](http://www.defra.gov.uk/AHVLA). By submitting a sample to any AHVLA laboratory, customers are deemed to accept these arrangements. Customers will be notified if samples are unsuitable for testing.

No disease or disease-free status *per se* of any animal is conferred, nor should be implied, by any single test result. No value is conveyed, nor should be implied, to any animal(s) to which results relate. Maximum liability to the customer for loss or damage arising from an inaccurate report based on a single test is limited to £1,000. It should be borne in mind that all tests have intrinsic inaccuracies.

In circumstances where a test result may be used as part of an assessment of disease status, a number of repeated tests or test samplings is advisable to minimise the chance of conferring a misleading status to any animal. If any test result is used to establish the disease status of any animal(s), due consideration should be given to seeking independent insurance to cover any implied value or cost that this status or change of status may convey.

There will be a number of occasions when your vet may wish to submit samples for additional tests, for example when you have purchased new stock. See section below on 'unscheduled samples'.



## Receiving reports

Test results will be returned to your veterinary practitioner in a results report. This will include some explanation of the results. (See Appendix 4 for an example.)

## Diagnostic testing

If you have animals on your farm showing signs of disease, please contact your veterinary practitioner who will arrange for samples to be submitted to the local AHVLA Regional Laboratory for diagnostic purposes. This is quite separate to the testing you are carrying out for health improvement purposes so will not be tested within the HerdSure® programme.

## Biosecurity

Good biosecurity is essential to the success of improving the health of your herd. Infectious diseases cannot be effectively controlled without also implementing effective biosecurity on your farm.

Guidance on biosecurity and other aspects of herd management is provided to support the protocols and should be discussed with your veterinary practitioner. You are advised to pay special attention to this advice as it is of great importance to achieving and maintaining improved herd health.

Once you have started a programme to eradicate a disease, or indeed have achieved eradication and want to remain disease-free, it is important that you follow recommended biosecurity procedures. You will find these in the relevant disease sections and the protocols include further information.

'Buying in' replacement cattle is a regular practice on many farms. The disease protocols outline the procedures and testing necessary to protect against introducing disease from added cattle. Your veterinary practitioner will advise you about situations when extra testing may be necessary.

## Summary of the service

Assurance that the assessment and management of the health status of your herds is being done in a structured, carefully planned way.

- can support health plans.
- up-to-date sampling, testing and management protocols suitable for both beef and dairy herds
- continual monitoring of your farm, including reminders when tests are due.
- submission forms with ear tag numbers of animals to be sampled.
- provision of sample containers for bulk milk samples.
- postage-paid labels for the submission of all samples.
- guidance and advice relevant to your herd (available to your registered veterinary practitioner).

## How to join the service

### Subscription to the service

Subscription to the service is by the veterinary practitioner completing a Farm Registration Form B (see the example in Appendix 1) and sending this to AHVLA.

You will either have chosen to pay a subscription to include all the disease protocols from the start or you will be able to ask your veterinary practitioner to add further protocols to your agreement as you go along.

### Definition of a registered herd

For the purposes of determining subscriptions (see details below) and also for herd management within protocols, a registered farm needs to be a single holding with a single County Parish Holding number (CPH). One registration covers all the animals registered on that holding, whether dairy or beef, and whether managed within a single herd or multiple herds or groups. The selected protocol for a disease (or number of diseases) will be applied to all the cattle kept under one holding number.

If a herd (that is cattle under one management system) is kept on two separate holdings with separate CPH numbers, both holdings should be registered at the same time. So that cattle can continue to move between the two (or more) holdings, both holdings should follow the chosen disease protocol(s) at the same time.

Where two or more herds are under the same ownership but under different management systems and have different CPH numbers, they will need to be registered for Herdsure® separately and will be tracked separately through the disease protocols.

### Definitions of cattle classes according to age and type

For the purpose of the Herdsure® service, the following definitions of cattle classes will apply.

<b>Milking cow or dairy cow</b>	An animal that has given birth to at least one calf and is used for the production of milk.
<b>Beef cow, beef suckler cow or suckler cow</b>	An animal that has given birth to at least one calf and is used to suckle the calf or other calves.
<b>Breeding bull</b>	An entire male animal which is over 1-year-old and is, or is intended to be, used for breeding purposes.
<b>Youngstock</b>	All male and all female cattle (up to the birth of their first calf) from birth, regardless of breed or intended purpose. The only exception is breeding bulls over 1 year of age.

## How much does the service cost?

There is an annual subscription charge, based on the size of your herd and the number of disease protocols to which you subscribe; your veterinary practitioner will invoice you for this.

Tests are charged for separately, at competitive rates, and you will also be invoiced for these by your veterinary practitioner.

## Invoicing

Each month, your veterinary practitioner will be sent details of any HerdSure® testing that has been carried out, along with details of any subscriptions that are due. If you have enrolled into the service and subscribed to a further disease protocol or your herd has been recently tested, your veterinary practitioner will be notified of the payment due.

## HerdSure® protocol for bovine viral diarrhoea (BVD) in cattle herds



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## Introduction

This protocol describes the process used to establish the disease status for bovine viral diarrhoea (BVD) in cattle and for control and subsequent monitoring.

This protocol is suitable for both dairy and suckler herds.

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

- sampling and testing to determine status.
- sampling and testing to identify and remove persistently infected (PI) cattle and, therefore, active infection from the herd.
- advice on appropriate measures to reduce the risk of re-introducing BVD virus (BVDV) infection together with sampling and testing to monitor the improved BVD health status of the herd.

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

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

## The disease

### Introduction

Bovine viral diarrhoea (BVD) is the name used to describe the diseases caused by infection with bovine viral diarrhoea virus (BVDV). The economic losses resulting from BVDV infection of cattle are considerable but are difficult to quantify because of its complex nature and because of the wide range of diseases it can influence.

### The disease

The cycle of disease is maintained by infection of the pregnant cow. BVD is observed as a number of different syndromes determined by the stage of pregnancy at the time of infection. Avoidance of infection of the unborn calf is crucial to the control of disease.

If cattle are infected just before breeding conception rates are reduced. Infection at the time of breeding may lead to early embryonic death and indeed abortion can be the result of infection at any stage of pregnancy. However, infection during the first third of pregnancy is critical because, at this stage, the immune system of the unborn calf has not yet achieved the ability to eliminate the virus. As a result of this, the unborn calf is eventually born with what is termed 'persistent infection' (PI).

These PI cattle, which do not produce antibody against BVDV, maintain the cycle of active infection. They produce large amounts of virus throughout their lives and, although they may appear to be normal, they often succumb to fatal mucosal disease before reaching maturity. However, significant numbers of PI cattle do survive to adulthood.

Occasionally, calves may show a range of defects at birth, particularly where BVDV infection takes place in months 3-5 of pregnancy. These defects include cataracts, abnormal brain development causing difficulty in walking, as well as growth defects such as domed heads, shortened tails and changes to the texture of the coat. These calves may or may not be PI.

PI cattle maintain the cycle of infection when they come into contact with pregnant cattle and the opportunity for the creation of new PI unborn calves arises once again.

When non-pregnant cattle of any age are infected by BVDV the consequences are less devastating. This is termed 'transient infection'. During this time the virus is present in the blood stream and there is a reduction in the animal's white blood cell count, thus impairing its immune system. During this period the animal has an increased susceptibility to other diseases such as enteric infections or pneumonia. Transient infection of bulls may result in reduced fertility with excretion of virus in the semen for a variable period of time. Very occasionally, when young bulls are transiently infected, excretion of BVDV is maintained for life.



## Detecting and removing the virus

Detection and removal of the PI calf are key to the control and eradication of BVDV. Cattle can be tested for both the presence of virus and antibody to assess their exposure to BVDV. Blood, milk and tissue samples can be used.

## Biosecurity

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

Control and eradication of BVD is also dependent on meticulous attention to biosecurity principles.

'Bought-in' cattle are a particularly dangerous source of new infection. The introduction of a PI animal into a herd can have disastrous consequences. Furthermore, a pregnant animal might carry an unborn calf that may turn out to be a PI.

The virus can also be introduced via the clothing of personnel or via shared machinery.

The programme outlined in this handbook includes a strategy to allow for the discovery of infected cattle before they are able to infect in-contact stock.

### Principles of biosecurity

- the boundaries of the farm premises must prevent cattle from straying off or onto the farm and must prevent nose-to-nose contact over fences or walls. For herds wishing to undergo or maintain CHeCS accreditation, installation of double fencing with a 3 metre gap between scheme cattle and neighbouring cattle is required.
- isolation facilities must be used for all added animals and must prevent contact with other stock. Discuss with your vet the suitability of any existing isolation facilities prior to use. If any of the animals are confirmed as infected, dung from the isolation facility must not be disposed of onto pasture that is to be grazed by cattle within 2 months. Where paddocks have been used for the quarantine of infected animals, other cattle must not be allowed to graze there for at least 2 months.
- all added animals should be isolated on arrival at the farm and testing carried out as specified in the protocol. Those animals can only enter the herd once the isolation period and tests have been completed, with results indicating freedom from infection. Additional rules apply to the purchase of bulls and are found in the added animals section.
- staff who work on other livestock enterprises must use farm-dedicated protective clothing and footwear.
- cattle, sheep and camelids should not graze together.
- colostrum from non-health scheme herds, or from health scheme herds of a lower status, must not be used.
- equipment such as drenching guns, surgical instruments and hypodermic needles must not be shared with another herd. If livestock trailers and handling facilities are shared between health scheme cattle and other livestock they must be cleaned and disinfected before use with health scheme cattle.
- delivery and pick-up points should be at a site isolated from other cattle on the farm. Where possible, drivers should remain in the cab and should certainly never assist

in removing cattle from pens unless they are using farm-dedicated protective clothing and footwear.

- you should discuss any proposed management changes with your veterinary practitioner as these may affect your herd's disease security.
- procedures for moving cattle onto the farm are contained within the protocol and should be adhered to. Where embryo transfer is used, it is important to ensure that embryos are sourced from herds of equivalent or higher health status than the recipient herd.
- accredited cattle must not be grazed on pasture previously grazed by non-accredited cattle until a period of 2 months has elapsed. The same grazing restrictions apply to accredited cattle if slurry or manure collected from non-accredited cattle has been used on the pasture.

## 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

Continued freedom from infection will depend on certain biosecurity measures and establishment of the BVD status of any added cattle before they come into contact with the herd.

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.

All classes of cattle should be tested for BVD antigen, ideally prior to leaving the farm of origin or, if not, on entry into isolation. Any antigen positive cattle should not be brought onto the farm.

**Non-pregnant cattle**

Following a 4 week period of isolation, non-pregnant cattle should be tested for BVD antibody and the results entered onto the Herdsure® database.

If significant numbers of sero-positive milking cows are brought into a herd, a significant rise in the bulk milk antibody readings for the herd will result. This is important in assessing the significance of rising BVD antibody levels in herds that have achieved Level 3 status.

**Pregnant cattle**

Pregnant cattle that are antigen negative may be brought onto the farm but should be isolated for a period of 4 weeks. Prior to release from isolation, a blood sample for BVD antibody should be collected and the results recorded. If the sample is negative no further action is required. If the antibody results are positive then these cows should remain isolated from the rest of the herd till they calve. A blood or tissue sample should be taken from the calf as soon as possible after birth and tested for BVDV by individual PCR (TC0655) or Erns tissue antigen (TC0872). Calves showing positive results are PIs and should be removed from the farm immediately.

**Breeding Bulls**

Bulls that have been transiently infected and, as a result, are antibody positive may excrete virus in semen. This is a rare occurrence but, for this reason, they should not be used for breeding until they have been in on farm for a minimum period of 9 weeks. They should remain in isolation for the first 4 weeks and be blood tested for BVD antibody after this time. There is a documented incidence of prolonged excretion of BVD in semen following transient exposure. If herds wish to exclude this risk, a Herdsure® consultant will be able to advise the practitioner on screening semen for BVDV.

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

Where it is intended to establish a BVD-free accredited herd by acquiring cattle accredited free of BVD, 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 BVD 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.

## The protocol

### Level 1

#### Objective of HerdSure® testing

- Level 1 testing aims to establish whether or not there is evidence of active BVD in a herd.

This level will also use any herd history and history of relevant test results already held by the veterinary practitioner or by AHVLA, covering the last 12 months.

Where the history and test results indicate clear evidence of BVD in the herd in the past 12 months, herds should start the BVD protocol testing at Level 2.

#### Sampling

When BVDV is circulating within a herd, cattle that have come into contact with the virus produce antibody to it. We can measure this antibody in both blood and milk samples.

In dairy herds, bulk milk samples are collected from every bulk tank used on the farm. If the level of antibody to BVDV in milk is below a defined level we can be confident that the milking cows have not been exposed to BVDV recently. (Refer to Appendix 7 for an example of instructions on bulk milk sampling.)

Where suckler cows are present on the farm, we can make the same assessment from blood sampling 10 cows and the breeding bulls. If the BVD antibody level is negative in all the samples, we can be confident that they have not been exposed to BVDV recently.

In the same way, measuring BVD antibody in the blood of separately managed youngstock will allow us to see if they have been exposed to the virus.

#### How many to sample?

We can calculate the number of cattle we need to sample in each management group to tell us whether or not virus has been circulating in that group. Since the contact between different management groups is variable, we need to be sure that samples are collected from all the management groups.

Your veterinary practitioner has been provided with a table showing how many of the cattle in each management group need to be sampled. 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 'separately managed'.

If all the blood samples and, in the case of dairy herds, the milk sample prove negative for BVDV antibody the herd can progress to Level 3. Herds working towards CHaCS accreditation can be certified free of BVDV infection 12 months after testing negative at Level 3. If any of the samples prove positive for BVDV, it will be necessary to do a systematic search of the herd for any PI cattle. This is the basis of Level 2 – finding and removing PI cattle.

## Level 2

### Objective of HerdSure® testing

- Level 2 testing aims to reduce the detrimental influence of active BVDV infection in the herd by identifying the PI cattle, which are responsible for the maintenance of the infection. Once identified, these cattle should be removed.

There are two routes into Level 2. Either:

- recently collected samples from the herd have identified the presence of BVDV, or
- blood and/or milk samples collected at Level 1 have identified BVD antibody.

An animal produces BVD antibody after it comes into contact with BVDV or, to a much lesser extent, after it has been vaccinated. Antibodies may persist for a long period of time – up to several years. Antibody may have originated from an encounter with BVDV that has since been removed from the farm, e.g. by the death or culling of a PI animal. There is no way of establishing this and therefore a thorough search of all the cattle in the herd must be carried out to ensure that none of them are infected with BVDV.

### Sampling

**At this stage, it is vital that no cattle at sampling are missed and that PI cattle are removed from the farm as soon as they are identified. PI cattle should not be sold to another holding because this would expose that farm to the animal health and welfare implications of BVDV infection.**

Where milking cattle are present, we can test these for BVDV by using the PCR test on a bulk milk sample. (Refer to Appendix 7 for an example of the sampling instructions.) This test can detect the virus in a milk sample that is made up of 300 contributing milking cows. It is important that the ear tag numbers of the cows that contributed to this sample are recorded accurately.

If more than one bulk milk tank is used, a sample from each tank must be collected and the cows contributing to each one must be recorded accurately. Where more than 300 milking cows are present, your veterinary practitioner will discuss a strategy to sample these in two groups.

If BVD virus is detected in the milk, we will ask for samples of milk individually collected directly from each cow, or individual blood samples collected by your vet, to identify which of the cows are infected. (Refer to Appendix 8 for an example of the individual milk sampling instructions.) The individual samples will be pooled and tested in groups of 10. If any of the milk pools are virus positive, your veterinary practitioner will blood sample the contributing cows to determine the infected animal(s). Discuss the options with your vet.

Following this, all cattle over 30 days of age in suckler herds and all non-lactating cattle in dairy herds should be blood sampled for BVD virus. These will be tested as before.

Your veterinary practitioner will not take blood samples from cattle under 30 days of age because the test used is not reliable below this age. When calves on the farm have reached this age they can be tested individually or in pools of 10. Until these calves have been established as BVD-free, they must not be in contact with other stock, particularly pregnant cows. For suckler herds this may pose a problem and for many the best solution will be to keep pregnant and recently calved cows in separate groups. Tissue samples (ear notch samples) may be used as an alternative to blood samples in calves. Tissue samples allow calves to be tested from birth thus eliminating the risk of PI calves infecting pregnant cattle whilst awaiting a blood test. Consult with your vet for sampling options.

One of the difficulties with BVDV control is that transient infection of a pregnant cow may or may not result in the development of a PI unborn calf. With either outcome, that cow will develop antibody and so we have no way of knowing if the calf is PI until it is born. Once we have tested all the cattle on the farm and removed the PI animals, there will be a number of unborn calves, which can only be tested after they are born.

It will take 9 months for all of these to be born and therefore we cannot be confident that freedom from disease has been achieved until after this. To allow for time taken to remove infected calves, and any residual infection accompanying them, all newborn calves should be tested until a period of 12 months has elapsed without the discovery of a PI animal. Either tissue or blood samples may be used for this.

**Please note: BVD tissue samples must be sent to HerdSure. We are unable to import results from another lab onto the HerdSure Management System.**

## 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 alert the veterinary practitioner to the re-introduction of active infection into the herd.

Once all the PI cattle from the herd have been removed, or it has been established that there are none, it is necessary to put in place a monitoring programme to ensure and demonstrate that BVDV infection does not become re-established in the herd.

Freedom from disease cannot be maintained without paying close attention to the principles outlined in the biosecurity section. Also, it will be necessary to put in place a programme to ensure no infected cattle are brought onto the farm.

### Sampling

The monitoring of dairy herds for antibody to BVDV will consist of two components:

- 3-monthly bulk milk antibody testing and
- annual testing of a number of cattle from each management group of youngstock between 9 and 18 months of age for antibody to BVDV.

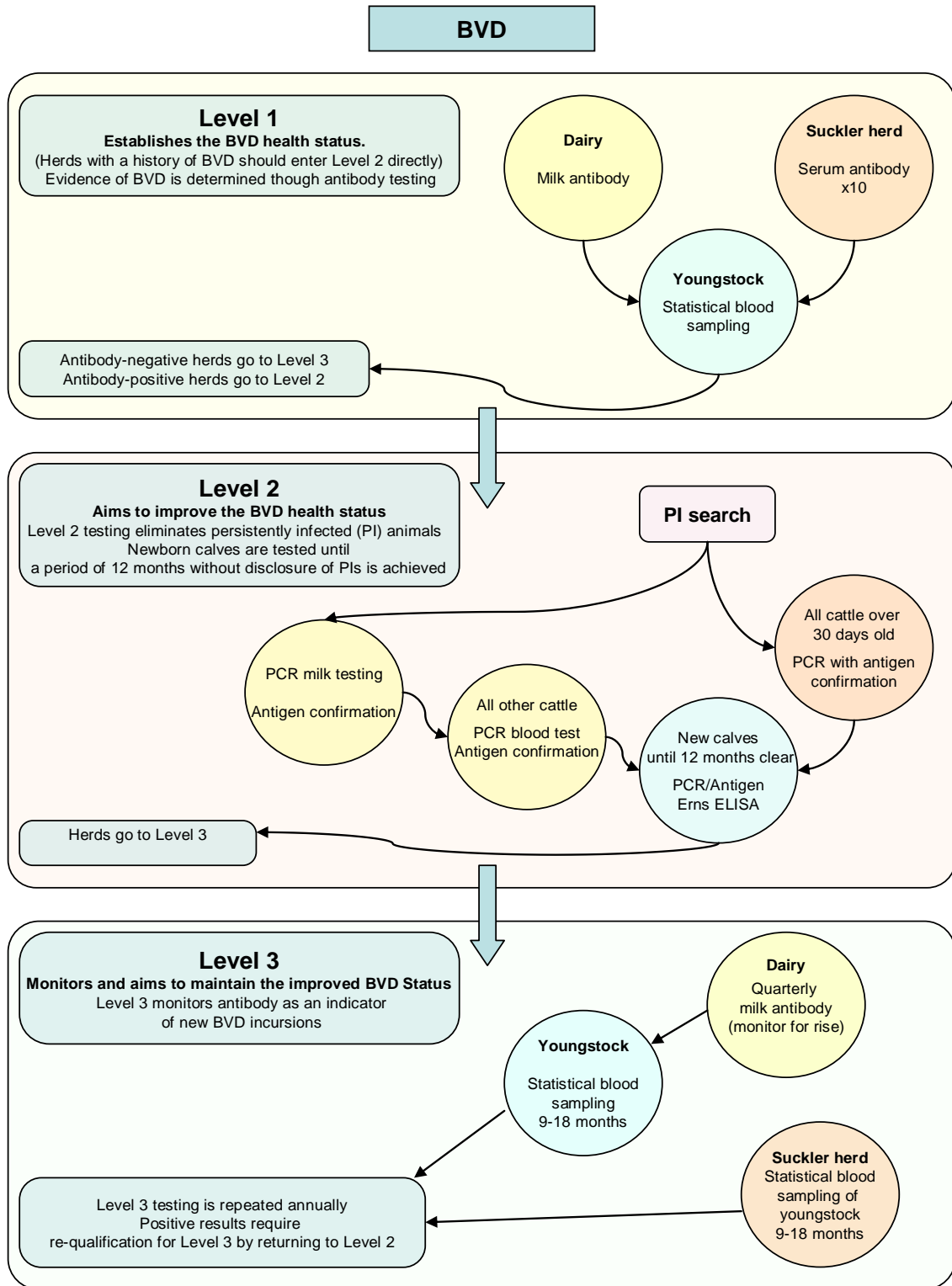
Suckler herds will monitor by annual statistically significant testing of youngstock.

### CHeCS Accreditation

Herds entering Level 3 direct from Level 1 will be eligible to apply for BVD CHeCS accreditation following completion of 12 months testing at Level 3, provided all the results are negative.

Herds entering Level 3 following a PI search at Level 2 will be eligible for BVD accreditation status after 24 months of testing at Level 3, provided all results are negative.

Please note there are additional biosecurity rules for herds undergoing accreditation and stringent requirements for farmer and vet declarations. More information is available on the CHeCS website ([www.checs.co.uk](http://www.checs.co.uk)).





## HerdSure® protocol for Johne's disease in cattle herds



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## Introduction

This protocol describes the process used to establish the disease status for Johne's disease in cattle and for control and subsequent monitoring.

It should be emphasised that the attainment of disease-free status by an infected herd can be a lengthy process and may take a number of years.

This protocol is suitable for both dairy and beef herds.

The three main elements of this HerdSure® protocol for Johne's disease are:

- sampling and testing to determine status.
- sampling and testing to monitor the improved health status of the herd together with advice on appropriate measures to reduce the risk of re-introducing infection.
- sampling and testing to monitor the improved health status of the herd together with advice on appropriate measures to reduce the risk of re-introducing infection.

The Johne's disease protocol comprises a testing regime to establish herd health status at three different levels:

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

## The disease

### Impact of the disease

Johne's disease, or paratuberculosis, is a chronic illness causing progressive loss of condition, diarrhoea and reduced milk production. It is a bacterial infection caused by *Mycobacterium avium paratuberculosis* (MAP). This organism is present in the faeces of infected animals and it can survive for over a year in the environment. It can also be present in colostrum and milk from both clinically and sub-clinically infected animals.

Calves can be infected in the uterus and therefore born already infected. Young calves are most susceptible to infection and the bacterium is transmitted mainly from contaminated faeces via the oral route. Increasing age is associated with increasing natural immunity and adult infection is considered uncommon. The disease has a long incubation period (years) and animals usually show clinical signs at around 3 to 5 years of age. The disease causes a progressive change in the intestinal lining leading to protein loss.

Infection is most likely to enter a herd by the purchase of clinically normal but infected livestock. Uncontrolled infection in the herd can lead to increasing losses due to reduced longevity, poor quality cull cows and reduced milk production. If nothing is done to control the disease, it will inevitably spread to produce more infected animals and ever greater losses in production.

The disease also affects sheep, deer and goats but strains are considered to be species-specific so disease in these other species does not normally cause a threat to cattle.

There is also the consideration that MAP may be implicated in Crohn's disease in humans, although there is no conclusive evidence to prove this. The Food Standards Agency and Defra advise on the precautionary principle that attempts should be made to minimise the number of organisms present in milk.

### Detecting and removing the organism (MAP)

As already noted, the disease has a long incubation period which may last for 5 or more years. During this time, the infected animal is likely to be clinically normal but may eventually pass the organism in the faeces at a low level. As disease develops, a higher number of organisms are passed and the likelihood of detecting the organism and an antibody response increases. By the time an animal shows clinical signs of diarrhoea, there may be millions of organisms in a gram of faeces.

### Testing methods

Infected animals can be identified by testing for antibodies to Johne's disease or by confirming the presence of the organism.

Testing for the antibody is carried out by ELISA testing on blood or milk samples.

The presence of the organism can be established from faeces or tissue samples using Polymerase Chain Reaction (PCR) or by culture methods.

The Johne's disease protocol makes use of the ELISA test as the main testing method. This test is not so sensitive in detecting animals that are clinically normal and in the early stages of infection but this does mean that animals with the highest risk of spreading infection are the most likely to be identified and targeted for action.

Although it is possible to screen a herd by taking individual rectal faeces samples from all animals >2 years old and screening by culture or PCR this is not part of the standard Herdsure® protocol. If a whole herd faeces screen is being considered, this should be discussed with your veterinary practitioner.

Bovine tuberculosis is also caused by a mycobacterium. It is therefore possible that the skin test for that disease may cause an antibody response that could be detected in the ELISA test for Johne's disease. To avoid any possibility of interference with the ELISA test, it is advised that blood or milk sampling for Johne's disease should not be carried out within the 3-month period following Tuberculin Testing (TT). For some herds, for example those undergoing repeated 60-day herd testing, this will not be possible. For these herds, contact your veterinary practitioner who will advise on the best course of action.

When milk samples from cows that have calved in the last 10 days are tested, there is a chance that the high levels of antibodies present could lead to a false positive result. It is therefore recommended that cows up to 10 days post calving are not tested using the milk ELISA.

The use of vaccine may need to be considered if the infection rate, determined by Herdsure® testing, is particularly high. This will not remove infection from the herd but will, in most cases, reduce the number of clinical cases and so increase longevity and productivity. For most effect, the vaccine should be used in calves less than a month old. This is a course of action that will need to be discussed with your veterinary practitioner. Because it is not possible to differentiate between vaccinated and infected animals, vaccinated herds cannot be enrolled into the Herdsure® service for Johne's disease. Herds that are vaccinated whilst undergoing the Herdsure® programme of testing should discontinue the programme.

## Keeping track of progress in Herdsure®

Each registered holding will be issued an **annual herd progress report**. 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 additional progress report can be produced. This 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.

## Biosecurity

### Avoiding the introduction of the bacterium into a 'clean herd'

The principles for this disease are essentially the same as for BVD. The following are risks that are specific to Johne's disease.

#### ***Sourcing of replacement animals***

Added animals could be infected but test negative and thereby introduce infection into the herd. This risk can be reduced by purchasing from a herd of similar or higher herd health status. If buying in animals of any age from a herd of unknown status is necessary, the animals should be tested by blood and faeces sampling on the farm of origin. If any animal is positive, animals from that source should not enter the herd.

New animals should be quarantined and tested by both blood and faeces sampling

before they enter the herd. The animals should not enter the herd unless both tests are negative. If groups of animals from different herds of origin are tested and one or more from any group tests positive, none of that group can enter the herd without loss of the herd's status.

### ***Shows and sales***

Due to the absence of a test with potential for detecting infection soon after possible exposure to MAP, no testing is required when show animals return to the herd. The risk of infection is considered highest in calves under 6 months of age and so these animals must be tested for four consecutive years once they are 2 years of age.

For CHeCS-accredited herds, the CHeCS rules must be followed:

If cattle from an accredited Johne's disease-free herd leave their home premises for fewer than 7 days and are prevented from direct contact with other animals' faeces and soiled bedding, these can rejoin the herd without the need for isolation and testing.

### ***Colostrum***

It is important that colostrum from a non-Herdsure<sup>®</sup> service herd or herd of lower status is not used on a Herdsure<sup>®</sup> service farm.

### ***Water***

Natural water sources are a risk for Johne's disease. If cattle of unknown health status, sheep or South American Camelids (SACs) have access upstream, or if the water has passed through another livestock farm, then it is preferable that cattle included in the Herdsure<sup>®</sup> service should not have access to it.

### ***Isolation facilities and grazing***

Cattle from Level 3 herds (including accredited cattle) must not enter housing, paddocks or fields that have housed Johne's positive (or non-accredited) animals in the last 12 months. A similar period must elapse before dung/manure from the housing of sero-positive (or non accredited) animals can be spread on to grazing land.

### ***Co-grazing with sheep and other ruminants or SACs***

It is recommended that sheep and other ruminants or SACs do not co-graze with Herdsure<sup>®</sup> service cattle.

## **Adding cattle – avoiding buying in disease**

The Herdsure<sup>®</sup> 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 should be noted that non-accredited added cattle will need to be tested annually until they have achieved four clear tests.

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

Where it is intended to establish a Johne's-free accredited herd by acquiring cattle accredited free of Johne's, 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 Johne's 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.

## The protocol

### Level 1

#### Objective of Herdsure® testing

- To establish whether Johne's disease infected animals are present in the herd.

Of particular importance to this protocol is the 'Farm Risk Questionnaire', which should be completed with your veterinary practitioner. This includes questions on possible historical cases of Johne's disease, the rearing of calves and the sourcing of replacement animals. This will allow our Herdsure® consultants to offer tailored advice to meet your particular farm needs.

Herds with laboratory-confirmed clinical disease established within the last 5 years, e.g. by culture or *post mortem* and histopathology, should progress to Level 2 without testing at Level 1.

#### Sampling

All animals more than 2 years old will need to be blood (red top sample) or individually milk sampled and the samples screened by antibody ELISA test. It is acceptable to submit a mixture of blood and milk samples for one herd test.

As already noted, there is also the possibility to screen a herd by taking individual rectal samples from all animals more than 2 years old and screening by culture or PCR. Individual samples may be pooled at the laboratory and examined in batches of five.

If positive milk or blood samples are disclosed in less than 2% of the cattle eligible for testing these may be tested by PCR of faeces samples to eliminate the possibility of cross-reaction. However, it should be noted that this option can only be used where these animals are homebred and there is no previous evidence of infection in the herd.

If a faeces sample is not available and the animal is slaughtered, then every effort should be made to obtain the ileo-caecal part of the intestine and the local lymph node in order to test them for the presence of MAP by culture/PCR or histopathology at your nearest AHVLA laboratory.

If any animal gives a positive result to the 'second test' then it is confirmed as infected. Animals giving negative results to the 'second test' will be considered on a case by case basis. Any subsequent animals that give a positive blood or milk test result do not need a 'second test' and will be automatically identified as infected.

If a herd has undergone a whole herd test where no reactors have been revealed, the herd can proceed towards Level 3 by having a repeat blood or milk test 12 months later at Level 2. If any animals are confirmed as sero-positive and infected and control of Johne's disease is to be attempted, the herd proceeds to Level 2.



## Level 2

### Objective of Herdsure® testing

- To reduce the detrimental influence of Johne's disease in the herd. Improved health status is achieved by the introduction of a management plan to reduce the occurrence of new infections together with annual testing of adult animals to identify infected animals.

Herds are at this level for the following reasons:

- laboratory-confirmed disease within the last 5 years.
- infection confirmed in a herd that entered at Level 1.
- the herd was negative at Level 1 and is proceeding towards Level 3.
- testing at Level 3 has revealed confirmed positive animals.

Where Johne's disease is present, management practices that allow young calves to access adult faeces or slurry will increase the risk of infection spreading to these calves. The 'Farm Risk Questionnaire' associated with this disease protocol, which your veterinary practitioner will complete with you, has been designed to determine whether these and other risks are present on farms so that risks can be reduced or removed should control be attempted.

### Management recommendations

Following these management recommendations should help reduce the number of new infections being established in newborn/young calves.

- ensure calving accommodation is clean and dry with adequate bedding and, ideally, is disinfected between calvings.
- calves should be removed as soon as possible after birth. If colostrum is to be taken, the teat and udders should be free of faecal contamination.
- waste milk should not be fed. Ideally milk replacer or pasteurised milk should be fed to calves. Do not use pooled colostrum.
- ensure feed, milk and colostrum are not contaminated with faeces from adult cows.
- ensure youngstock do not graze manured pasture and only mix young and adult stock when over 12 months old.
- isolate any cows with possible Johne's disease and test to establish disease status.
- cull unthrifty sero-positive cows.
- try to purchase replacement animals from a low risk source.
- remove the latest offspring from confirmed cases of Johne's disease or sero-positive animals and do not keep as replacement animals.

When testing identifies infected animals, ideally they should be removed from the herd as soon as possible, along with their latest offspring. However, if many animals are identified as 'sero-positive', this may not be possible. In this case, those that pose most risk to other animals should be removed first, as part of a staged removal of sero-positives

Cows that have high antibody results should be prioritised for culling. This may be influenced by reduced milk production, declining body condition, persistent scour, infertility, lameness and mastitis as well as the availability of replacements. Calves born to cows with high antibody results should not be kept as replacements and should be culled.

Testing of the herd at 12-monthly intervals continues until no more infected animals are detected; the herd can then progress to Level 3. Owing to the possibility of youngstock incubating the disease, herds with previous evidence of MAP infection will need to have three clear consecutive annual tests before progressing to Level 3.

Where positive animals are identified in herds with no previous history of infection these may be tested by PCR of faeces samples, provided certain conditions are met. Your veterinary surgeon will be able to explain these to you as and when necessary.

## Level 3

### Objective of Herdsure® testing

- To monitor and maintain the improved health status of the herd.

Infected animals can become infectious (i.e. start to shed MAP) without showing signs of Johne's disease. To increase confidence in maintaining a disease-free status, the herd must be monitored for a number of years at Level 3. Every year that the herd is 'monitored negative' increases the degree of confidence that infection has been controlled. The Herdsure® system will maintain records to reflect progress within Level 3.

Herds enter Level 3 by three routes:

- negative adult herd testing at Level 1 followed by negative adult herd testing at Level 2a 12 months later.
- following positive results at Level 1, herds have achieved three consecutive negative adult herd tests 12 months apart following disease reduction by identification and removal of infected animals at Level 2b.
- herds with a known history of Johne's disease have achieved three consecutive negative adult herd tests 12 months apart following disease reduction by identification and removal of infected animals at Level 2b.

### Continued monitoring

It is essential that a monitoring protocol is put in place so that 'freedom from infection' can be confirmed or, if infection is still present or has been introduced, it is detected. The more 'monitored negative' herd tests achieved, the more confident we can be that infection is no longer/is not present.

At Level 3, testing of individual blood or milk samples from all animals over 2 years of age is performed annually. This will commence 12 months after qualifying from Level 2. Additionally, any added animals must be blood or individually milk sampled annually until achieving four consecutive negative test results.

If an animal dies on the farm and blood or faeces samples cannot be taken, every effort should be made to obtain the ileo-caecal junction and draining lymph node for submission to the nearest AHVLA laboratory, where it can be examined by histology, culture or PCR testing.

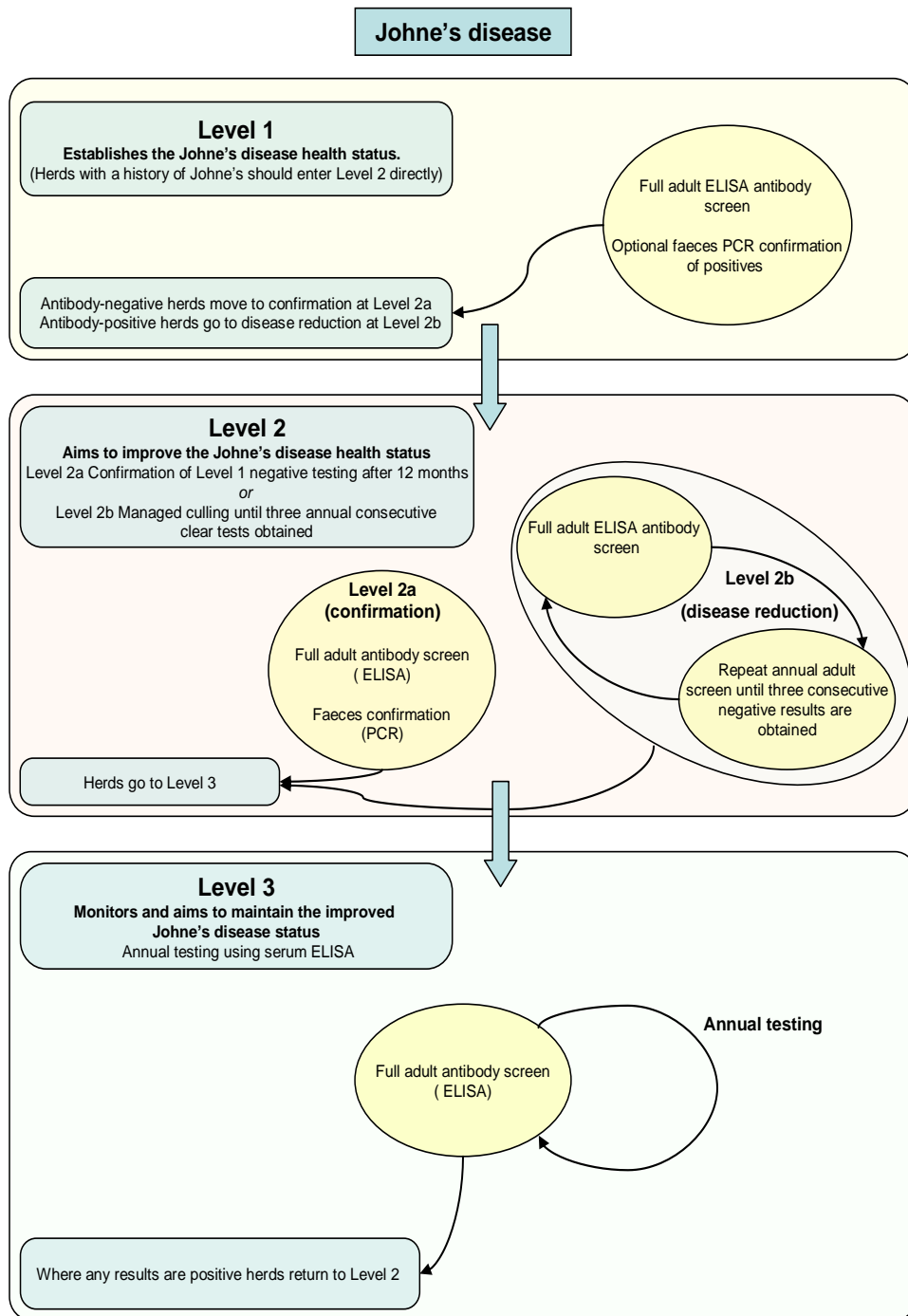
If any animal more than 6 months old presents with clinical signs that may suggest Johne's disease (chronic scour and loss of condition with or without reduced milk reduction), your veterinary practitioner should examine the animal. If Johne's disease cannot be ruled out then the veterinary practitioner will take a sample of blood and faeces. The blood sample will be tested for antibody by ELISA and, if the result is positive or inconclusive, the faeces sample will be screened for the organism. If this gives a confirmed positive result the herd returns to Level 2.

## CHeCS accreditation

**Accredited free status:** A herd is Accredited Free if **three** clear qualifying tests (full herd tests) at an interval of 12 months have been achieved without any reactor being detected. A herd will be eligible for accreditation either following a full herd bleed after 12 months at Level 3 from Level 2a or upon entry at Level 3 from Level 2b. The date the herd first achieved Accredited Free status will be included on the Certificate of Accreditation. Should a herd lose status and then regain it having met the subsequent testing requirements the date on the certificate will be when accreditation was regained.

### CHeCS Health Plan – new for 2012/2013

For members working towards CHeCS accreditation a health plan covering Johne's disease must be in place. It must be updated annually and signed off by both the vet and herd owner/manager. On joining the Accreditation Programme the health plan must be submitted to Herdsure® within 2 months of carrying out the herd test. Thereafter the health plan (covering the last year) must be submitted with the herd test. The health plan must cover the three mandatory control elements detailed in the CHeCS Technical Document: 3.1 Antibody positive animals, 3.2 Cull all reactors and 3.3 Offspring of female test positive animals. The veterinary practitioner must detail in writing why any particular guideline has not been followed. For further information, visit [www.cheecs.co.uk](http://www.cheecs.co.uk)



## HerdSure® protocol for liver fluke infection in cattle herds



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## Introduction

This protocol describes the processes used to determine the liver fluke status of a cattle herd and for the control and subsequent monitoring.

This protocol is suitable for both dairy and beef herds.

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

- sampling and testing to determine status.
- advice on appropriate treatments, if any, following test results.
- advice on appropriate management measures, if any, to reduce the risk of liver fluke infection following test results.

This protocol refers only to the control of liver fluke infection in cattle. Liver fluke can affect other species of animal such as deer, South American Camelids (SAC) and especially sheep. Liver fluke monitoring, and if necessary control measures, should also be applied to these animals if they are present on the farm, especially if they share grazing with cattle. Your AHVLA Regional Laboratory is able to provide appropriate testing and advisory services for this purpose.

The liver fluke protocol comprises three levels of 'health status':

<b>Level 1</b>	Establishes the liver fluke infection status of the herd.
<b>Level 2</b>	Aims to reduce the burden of liver fluke in the herd to a level at which it does not significantly affect cattle production or welfare.
<b>Level 3</b>	Monitors and aims to maintain the improved (or established as satisfactory at Level 1) health status of the herd for liver fluke infection.



## The disease

### Introduction

The liver fluke *Fasciola hepatica* is a parasite that infects the liver of grazing animals, including cattle, sheep, deer, llamas, alpacas and some wildlife such as rabbits. The parasite causes liver damage by the migration of immature larvae and blood loss by the feeding activities of the adult parasite. The term for diseases caused by the liver fluke is *fasciolosis*.

Knowing how to control this parasite requires an understanding of its lifecycle and how it spreads.

### Lifecycle

The liver fluke has a lifecycle that includes a species of snail as an intermediate host, with grazing animals being the final host. Adult liver flukes in the liver of cattle or sheep lay eggs that pass out onto the pasture in faeces. Each egg hatches to produce a larva that infects the snail species where it multiplies. The next stage of the parasite then leaves the snail and makes a cyst on the grass to be eaten by grazing animals. Larvae in the cyst hatch out in the intestine of the animal and migrate to the liver where they mature and lay eggs for the lifecycle to begin again.

Warm wet weather conditions are necessary for the lifecycle and for the snails to multiply. This is why there is more fluke infection in very wet years such as experienced in 2007, 2008 and 2009.

Animals become infected in the autumn and early winter by grazing infective pasture. Wet pasture (where the snails breed) poses more risk to grazing animals as there are more encysted larvae to be eaten. Infection is also commonly acquired in May and June but, because of changing weather patterns, infection should not be ruled out at other times of the year as well.

### Spread of infection

Fasciolosis is commonly diagnosed by AHVLA in the wetter western half of Great Britain. Over the past 15 years, there has been significant spread to other parts of the UK. It is now found with increasing regularity in the east of Scotland and East Anglia.

This spread has been made possible by:

- the greater movement of infected animals, particularly sheep, to farms that operate poor biosecurity.
- changing weather patterns, with increased rainfall and milder winters throughout the UK which benefits the lifecycle of the parasite and its intermediate snail host.

Eradication of the liver fluke is difficult because wildlife reservoirs can maintain infection on many farms. The objective, therefore, is to reduce infection to a manageable level that does not affect the economics of farm production or impair cattle welfare.

## Impact of the disease

The parasite can cause significant economic loss. One estimate in 2001 for the economic loss caused by liver fluke infection worldwide was \$200 million. Another study of the financial loss in Switzerland in 2005 was estimated as €299 per infected animal. A more recent study involving bulk tank milk samples estimated the loss of production in dairy cows as a decrease in annual average milk yield of 0.7 kg per cow per day and an increase in the mean inter-calving interval of 4.7 days.

Many farmers will have first-hand experience of liver fluke infection from the condemnation of livers in cattle and sheep sent for slaughter. Infected livers have scarring and fibrous reactions that make them unsuitable for human consumption. In addition, live animals can show signs of disease.

**Acute fasciolosis** occurs when the migration of large numbers of immature flukes cause liver damage, leading to blood loss. It can lead to the death of the animal. The symptoms of acute fasciolosis are seen more commonly in sheep and only rarely in cattle because the bovine liver is larger and more able to withstand this challenge.

**Chronic fasciolosis** is more common in cattle and occurs when small numbers of encysted larvae are eaten over several weeks. Clinical signs in cattle are associated with chronic inflammation and the blood feeding of the adult parasite. Animals show weight loss and reduction in milk yield. In severe cases, animals develop fluid accumulation under the jaw ('bottle jaw'). Chronic fasciolosis is commonly associated with diarrhoea in cattle and can occur with other infections such as Salmonellosis and Johne's disease.

**Sub-clinical infection** is also recognised in cattle. Growing animals with sub-clinical infection have poorer weight gains, while dairy cows have lower milk yields. Metabolic disease and 'downer cow syndrome' associated with chronic fasciolosis have also been reported.

## Testing for the disease

The main difficulty with some of the diagnostic tests is proving the animal is infected at the time of sampling, i.e. 'current infection'. The gold standard for diagnosis is post-mortem examination and finding the parasite in the liver.

Fluke egg detection in faeces is a widely used test, but has a sensitivity of 60%. This means there is only a 60% chance of detecting infection by this method if it is present. There are a number of reasons for this:

- faecal egg detection cannot confirm immature fluke infection where no eggs are produced.
- when mature flukes produce eggs, only low numbers are produced (one to two eggs per gram of faeces).
- fluke eggs can also accumulate in the gall bladder and are excreted intermittently.

To maximise the chance of detecting fluke eggs, composite faeces samples (where a number of individual samples are added together) are used for the Herdsure® service.

The composite fluke egg detection test, as used in the Herdsure® protocol, is a screening method to detect fluke eggs in 10 faeces samples: 40 faeces samples will be collected randomly, from fields or pens, which will be used to make up four composite samples to look for fluke eggs.

The detection of fluke antibodies in blood samples is also a reliable way to demonstrate exposure to infection. Animals that eat encysted larvae develop antibodies in the blood about 2 weeks later. Antibodies can persist for up to 9 months after treatment, so this test does not prove that an individual is currently infected.

However, by blood sampling a statistically valid number of animals, we will have a good idea whether there is infection in the group tested. Blood sampling can be done when your veterinary practitioner is taking blood samples for other diseases such as BVD.

The bulk milk tank ELISA detects liver fluke antibodies that dairy cows excrete in their milk. This is a good screening test for lactating dairy cows that contribute their milk to the bulk milk tank.

## Biosecurity

Farmers who subscribe to the Herdsure® service must ensure that they operate biosecurity measures that prevent the introduction or re-introduction of fluke infection onto their farm. Owing to the difficulty in proving current infection, purchased animals should be treated with a flukicide drench before or after arrival on the farm.

Treatment before arrival is best; treating 10 days before arrival allows time for any fluke eggs in the intestinal tract to be expelled so that eggs are not present to seed the pasture on the farm.

If treatment before arrival is not possible then animals should undergo a period of quarantine and treatment after arrival. Any faeces should not be put on the land because of the risk of seeding the pasture with fluke eggs.

Resistance to one of the most important flukicides, triclabendazole, is now increasingly reported. Your veterinary practitioner can advise you which products contain it. There is a risk of introducing infected animals with fluke that are resistant to triclabendazole. Wherever possible, animals should be sourced from farms where the disease status is known and there is no possibility of introducing triclabendazole-resistant fluke. If there is a risk of introducing triclabendazole-resistant fluke then animals must be treated with a flukicide that does not contain triclabendazole. Your veterinary practitioner can advise you which product to use.

## 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

The Herdsure® service recommends that all added animals are isolated and tested before joining the herd.

## Treatment and control

Suggested treatment strategies are explained below. These should be discussed with your veterinary practitioner to ensure the correct choice of flukicide and the correct timing of treatment.

### (i) Non-milking cattle

The period of greatest risk is the autumn and early winter. A minimum of two treatments should be given. The first treatment should be given at housing or, if cattle are not housed, during late autumn or early winter. A product that kills immature and adult fluke, such as triclabendazole, is advisable.

A second treatment in the spring will kill fluke that have either survived the housing treatment or, in the case of out-wintered cattle, is the result of re-infection. A product that kills only adult fluke will suffice for this second treatment for housed cattle. For outwintered cattle that have grazed pastures that may be contaminated with liver fluke metacercariae, use a flukicide effective against both adult and immature liver fluke.

In heavily fluke endemic areas, a third treatment can be given in July.

In time, it may be possible to reduce the numbers of treatments given to a single annual dose at housing. Owing to the likelihood of wildlife reservoirs, this treatment should continue.

### (ii) Milking cattle

There are no flukicide products available with zero milk withholding time. In endemic areas, individual cows are treated at drying off and with a variety of products.

For spring-calving herds, other possibilities include a treatment at drying off in the winter using triclabendazole, as this removes both mature and immature flukes. Triclabendazole cannot be given to lactating cows so you must consult your veterinary surgeon for advice about the timing of treatment in order to avoid lengthy periods of milk withdrawal. Treatment after housing has the benefit that dairy cows will not ingest significant numbers of encysted larvae when housed, although some will be present in hay and silage.

In cases where a heavy challenge and clinical disease is likely, you may want to consider synchronising the calving pattern so that animals are not lactating during the autumn.

### (iii) Mixed grazing (cattle and sheep)

On mixed cattle and sheep farms where fluke infection has been diagnosed, treatment of sheep is advised. In the autumn, treatment with a compound effective against immature fluke is recommended. Farmers should avoid combined products to avoid unnecessary treatment of sheep for roundworms, as this can select for resistance in roundworms. Sheep brought onto the farms for winter grazing should be treated with a flukicide 10 days before arrival to avoid introduction of infection.

### (iv) Other control measures

There is a greater risk of infection in wetter areas of the farm, and around ponds and streams, because of the presence of the intermediate snail host. These areas can be fenced off, particularly if there is a forecast of a high risk of infection (see below).

It is advisable to keep lactating cattle on the drier areas of the farm in the autumn because of the difficulties in treating the dairy herd.

## The protocol

### Level 1

#### Objective of Herdsure® testing

Level 1 establishes the liver fluke infection status of the herd. This may be achieved by one of two options:

- detection of liver fluke infection in the herd by following the Herdsure® Level 1 protocol.
- evidence of recent liver fluke infection by another means such as diagnostic testing of clinical cases, *post mortem* examination or meat inspection.

The Herdsure® Level 1 protocol gives a number of different testing options depending on the herd makeup and the following steps should be followed:

1. Determine (with your veterinary practitioner) which groups of animals are at risk of encountering liver fluke and which are not (see below).
2. Decide (with your veterinary practitioner) which of the following two options you will use for sampling – you may use different sampling methods for different groups:
  - faecal sampling
  - blood sampling.
3. Dairy herds have the additional option of testing the milking cows using a bulk milk test.

**At-risk animals** are those that have grazed pastures on the farm where there is significant risk of harbouring fluke-infected snails and where the interval between earliest exposure on pasture and sampling is at least 12 weeks. This category of animals should *exclude* the following:

- the main cow herd (this is sampled separately).
- any cattle treated for liver fluke within the 3 months prior to sampling.
- bought-in cattle (please seek advice from your veterinary practitioner).
- suckler calves that graze with their dams.

#### Sampling

**Faecal sampling** can be carried out by farm staff (see Appendix 7 for an example of the sampling method). It involves taking 40 separate faecal samples from the floor of the shed or the pasture. These are combined at the laboratory into four groups of 10 and each is tested for the presence of liver fluke eggs.

**Blood sampling** should be carried out by your veterinary practitioner. It involves the collection of blood samples from sufficient animals to give confidence to determine whether disease is present or not. This test measures antibodies to liver fluke.

**Bulk milk sampling** can be carried out by farm staff (see Appendix 7 for an example of

the sampling method) but please note that this test should only be used when at least 75% of the milking cows are contributing to the bulk milk tank. Please consult your veterinary practitioner for further advice if this is not the case.

All the above testing regimes should be carried out in the period from November to January as this is the time when adult, egg-producing flukes are likely to be present and when levels of immunity are likely to be highest.

If all the tests carried out are negative, the herd can progress directly to Level 3. If any of the tests are positive or inconclusive, this indicates that significant liver fluke is present in the herd and the herd progresses to Level 2. Level 2 aims to reduce the burden of liver fluke in the herd to a level at which it does not significantly affect production or welfare.

## Level 2

### Objective of HerdSure® testing

- Level 2 aims to reduce the burden of liver fluke in the herd to a level at which it does not significantly affect cattle production or welfare. Herds can enter Level 2 if the Level 1 protocol results indicate significant liver fluke infection in the herd or if there is other evidence of recent liver fluke infection (see above).

### Procedure

Level 2 covers a period of 12 months during which the following steps are carried out:

- the herd is treated for liver fluke (see guidance in the treatment and control section above).
- biosecurity measures are followed to reduce the risk of introducing liver fluke.
- management practices are carried out to reduce the risk of exposure of cattle to liver fluke (see guidance above in 'other control measures').
- the herd is sampled as in Level 1 during the next winter period November to January.

If all of the test results are negative, the herd can progress to Level 3, which aims to monitor and maintain the improved fluke status of the herd. If any of the tests are positive or inconclusive, the herd remains in Level 2 for a further 12-month period.

## Level 3

### Objective of HerdSure® testing

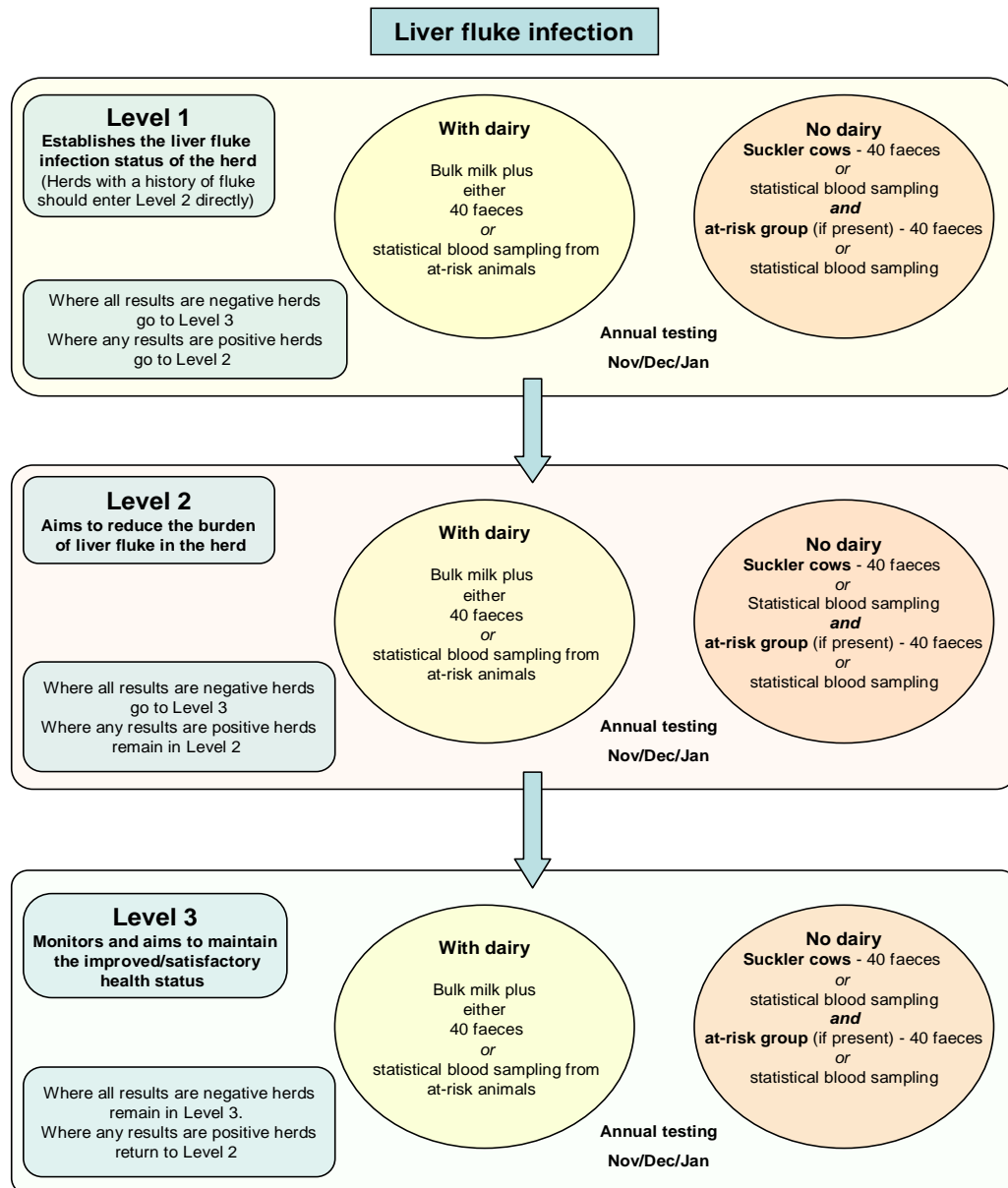
- Level 3 aims to monitor and maintain the improved (if moving from Level 2) or satisfactory (if moving from Level 1) liver fluke status of the herd.

Entry to Level 3 can be achieved either direct from Level 1 or from Level 2, in both cases where all testing has proved negative for liver fluke.

### Procedure

Level 3 covers a period of 12 months during which the following steps are carried out:

- the herd is treated for liver fluke (see guidance in the 'treatment and control' section above).
- biosecurity measures are followed in order to reduce the risk of introducing liver fluke.
- management practices are carried out in order to reduce the risk of exposure of cattle to liver fluke (see guidance above in 'other control measures').
- the herd is sampled as in Level 2 during the next winter period November to January.



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## HerdSure® protocol for leptospirosis in cattle herds



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**AHVLA HerdSure® protocols are not intended for use independently of the HerdSure® Cattle Health Improvement Service.**

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## Introduction

This protocol describes the processes used to establish the disease status for leptospirosis caused by *Leptospira* Hardjo (*L. Hardjo*) in cattle and for control and subsequent monitoring.

The protocol is suitable for both dairy and beef herds.

*L. Hardjo* is the cause of a significant disease of cattle resulting in loss of milk yield/milk drop, infertility and abortion. It is also a potentially important infection of humans.

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

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

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

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

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

## The disease

### Introduction

Although it has recently been shown that *L. Hardjo* comprises two distinct species, it is not clear which of these predominates in Great Britain since current tests are insufficiently sensitive to distinguish between the two. However, they both cause similar disease in cattle and the means to control them are essentially the same. Hence, for the purposes of this handbook, both will be referred to generically as *L. Hardjo*.

Leptospirosis in cattle causes infertility, milk drop, abortion and the birth of weak and unviable calves.

The disease can also be transmitted from infected animals to people. Human infection is usually characterised by a 'flu-like' illness, although in rare cases the disease can be more severe or even fatal.

### Routes of infection

Exposure to urine from infected animals is the main route by which *L. Hardjo* is transmitted between cattle. However, venereal transmission is also possible since the organism can be excreted in semen and uterine discharges; aborted fetuses, foetal membranes and the discharges associated with abortion are also potentially infectious. Infected animals can excrete the organism for long periods (from months to years) and some may continue to excrete even after antibodies to infection can no longer be detected in blood samples.

### The role of sheep

Sheep may act as carriers without showing any clinical signs and have been identified as a potential source of infection for cattle.

### Clinical signs associated with *L. Hardjo* infection

In cattle, the following syndromes are associated with *L. Hardjo* infection.

- **Abortion.** This usually occurs in the second half of pregnancy. *L. Hardjo* infection in late gestation may also result in the birth of weak or unviable calves. When infection is endemic in a herd, the only sign of disease may be abortion in newly introduced heifers that have no immunity.
- **Milk drop.** This may affect a large proportion of the herd simultaneously. Some affected cows have a raised temperature; some may show a 'flabby' udder affecting all four quarters. There can be an associated high milk somatic cell count. The classical acute milk drop syndrome is now uncommon in Great Britain. However, in infected herds, there may be reduced herd milk yield due to sub-clinical infection in some cows.
- **Infertility.** Infertility can be significant in the first year following introduction of infection into a susceptible herd. It is characterised by low conception rate to first service, increased calving to first service interval and increased number of services for each successful pregnancy. Infertility may also affect heifers in infected herds that stop vaccinating.

## Detecting infected cattle

When cattle are infected with *L. Hardjo*, antibody is produced. This antibody can be detected in blood and milk samples. The ELISA test measures a type of antibody that, although not detectable until 3 or 4 weeks after infection, persists for 2 or 3 years after infection. It is for this reason that this test is preferred.

## Control of leptospirosis

The removal of all antibody-positive cattle and the prevention of new infection entering the herd is the ideal means of control of leptospirosis. This will not be practical for many herds with significant numbers of antibody-positive cattle.

Vaccinating all the animals in the herd is the main control measure for active leptospirosis infection in cattle. Owing to the risk of human infection, vaccination of the entire herd should be seriously considered if active infection is demonstrated. Your veterinary practitioner will be able to alert you to the presence of active infection by regularly reviewing antibody results for cattle in your herd and by investigating the occurrence of the clinical signs described above in cattle on your farm.

Vaccination of infected cattle does not prevent them excreting *L. Hardjo*.

Since antibody produced by vaccination cannot be distinguished from that resulting from 'natural' exposure to *L. Hardjo*, it is not possible to demonstrate that vaccinated cattle are free from infection.

## Biosecurity

It is the responsibility of the herd manager, in consultation with their veterinary practitioner, to ensure good biosecurity in herds subscribed to the Herdsure® service.

The following potential means of introducing leptospirosis into herds should be addressed and the risk kept to a minimum.

- **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 clean protective clothing and footwear. 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 leptospirosis status must be cleaned and disinfected before they are used with herds subscribed to Levels 2 and 3 of the Herdsure® leptospirosis protocol.
- **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 surgical instruments** must be sterilised before they are used on animals in the herd. Equipment such as drenching guns must not be shared with cattle from other herds.
- **farm boundaries** must prevent cattle from straying off or onto the farm and must prevent nose-to-nose contact with cattle of a lower or unknown health status.
- **contact with cattle of different health status:** Cattle herds subscribed to Levels 2 and 3 of the Herdsure® leptospirosis protocol must not come into contact with cattle from herds which are not of an equal or higher Herdsure® leptospirosis status, otherwise they will lose their status. To re-introduce them to the herd, they must be regarded as added animals (see the requirements for buying in animals explained below).
- **isolation facilities:** An isolation facility that prevents contact with other stock must be provided for all added animals. A dedicated building separate from other cattle buildings is required, although a separate paddock that prevents contact with other livestock may suffice. The drainage or dung storage area should not be shared with other cattle. Dung should be spread on land or added to the main dung store only when all cattle in the isolation facility have passed all the required tests. Where cattle are confirmed as positive, dung must not be disposed of onto pasture that is to be grazed by cattle for a period of 12 months.
- **co-grazing with sheep or other domestic ruminants or camelids:** Although not a mandatory requirement, it is strongly recommended that, wherever possible, cattle and sheep do not graze together. It is also recommended that cattle do not co-graze with other domestic ruminants and camelids.
- **CHeCS accreditation:** there must be a 2 month interval before accredited cattle follow non-accredited cattle, sheep or other potentially infected animals (other domestic ruminants or camelids) 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.
- **water:** Piped mains water should be used rather than natural water sources whenever possible. Water sources which arise from neighbouring land grazed by cattle or sheep could be contaminated by infected urine and therefore should be avoided.
- **Notification:** Herd owners and managers who are participating in Herdsure® must inform their 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 leptospirosis into a herd. Minimising the number of cattle bought in 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 leptospirosis history of the herd of origin of cattle intended for purchase in order to avoid buying cattle from a herd with leptospirosis 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.

Cattle can be introduced into a herd but they will be subject to isolation and testing before they join the remainder of the herd. Such cattle must be isolated for 28 days. At the end of this period, antibody testing will be carried out. These cattle can only enter the herd when both the isolation period and the testing have been completed with negative results.

Very occasionally, cattle may have 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 for antibody 12 months after they join the herd.

### ***Action if cattle have a positive result while in isolation***

- cattle testing positive should be removed from the holding without delay. If animals are bought in batches and one or more test positive the remaining animals should only be permitted to enter the herd after an additional 28 days in isolation and negative blood test.
- 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 a leptospirosis-free accredited herd by acquiring cattle accredited free of leptospirosis, 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 leptospirosis 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.



## The protocol

### Level 1

#### Objective of Herdsure® testing

- Level 1 testing aims to establish whether or not there is evidence of *L. Hardjo* infection in a herd.
- Level 1 also uses any herd history and relevant test results already held by the veterinary practitioner or by AHVLA.
- where the history and test results indicate clear evidence of *L. Hardjo* in the herd in the past 12 months, herds should start the Herdsure® leptospirosis protocol testing at Level 2.

#### Sampling

For Level 1, the following samples will be taken:

- *milking cows*: This is done by taking a bulk milk sample.
- *suckler cows*: This is done by blood sampling a proportion of the group.
- *replacement youngstock that are more than 1 year of age*: As for suckler cows, this is done by blood sampling a proportion of each management group. Your veterinary practitioner will advise you which cattle are classed as separate groups.
- *all breeding bulls*: One blood sample from each is required.

## Level 2

### Objective of HerdSure® testing

- Level 2 testing aims to improve the health status of the herd for leptospirosis by reducing the detrimental influence of *L. Hardjo* infection in the herd. This is done 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.

Once the *L. Hardjo* status of a herd is known, two options may be considered:

- **Level 2a** to test all the eligible cattle and remove all ELISA-positive cattle from the herd.
- **Level 2b** to monitor the immunity of the herd.

### Sampling

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.

#### Level 2a – test and remove positives

Successful completion of Level 2a requires blood sampling of all the dairy cows (both dry and milking) and all the suckler cows, cattle over 1 year old intended for introduction into the milking or suckler herds and all the breeding bulls.

All the cattle giving positive antibody test results should be removed from the herd.

The herd can only move to Level 3 when all the required animals have been tested without revealing positive results on two successive occasions no less than 6 months and no more than 12 months apart.

#### Level 2b – continued monitoring

The following samples are required:

- *dairy-only herds*: Bulk milk samples collected every 3 months for antibody testing.
- *beef-only herds*: This is done by blood sampling a proportion of the suckler cow herd.
- *herds with both dairy and suckler cows*: Bulk milk samples collected every 3 months for antibody testing together with blood sampling of a proportion of the suckler cow herd and each management group containing youngstock between 8 and 11 months of age. All bulls must also be sampled.

Unless a vaccination policy is being applied to the herd, there should be a reduction over time in the milk antibody level and/or the number of animals with positive antibody results. Indeed the herd may eventually become serologically negative. At any stage you may wish to consider moving the herd to Level 2a.

If there is an increase in milk antibody or an increase in the number of animals showing positive antibody results, this may indicate the introduction of active infection. As *L. Hardjo* can cause severe illness in humans, the introduction of infection or evidence of active infection is of serious concern. In these instances your veterinary practitioner will be able to advise you on an appropriate course of action. If the herd in question is unvaccinated, vaccination may be considered.

## Level 3

### Objective of Herdsure® testing

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

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

### Sampling

The bulk milk ELISA testing begins 3 months after a herd enters Level 3 and continues at 3-monthly intervals. Blood sampling of a proportion of the suckler cow herd and of each separate management group of youngstock over 12 months of age along with individual sampling of bulls begins 1 year after the herd enters Level 3 and continues annually thereafter.

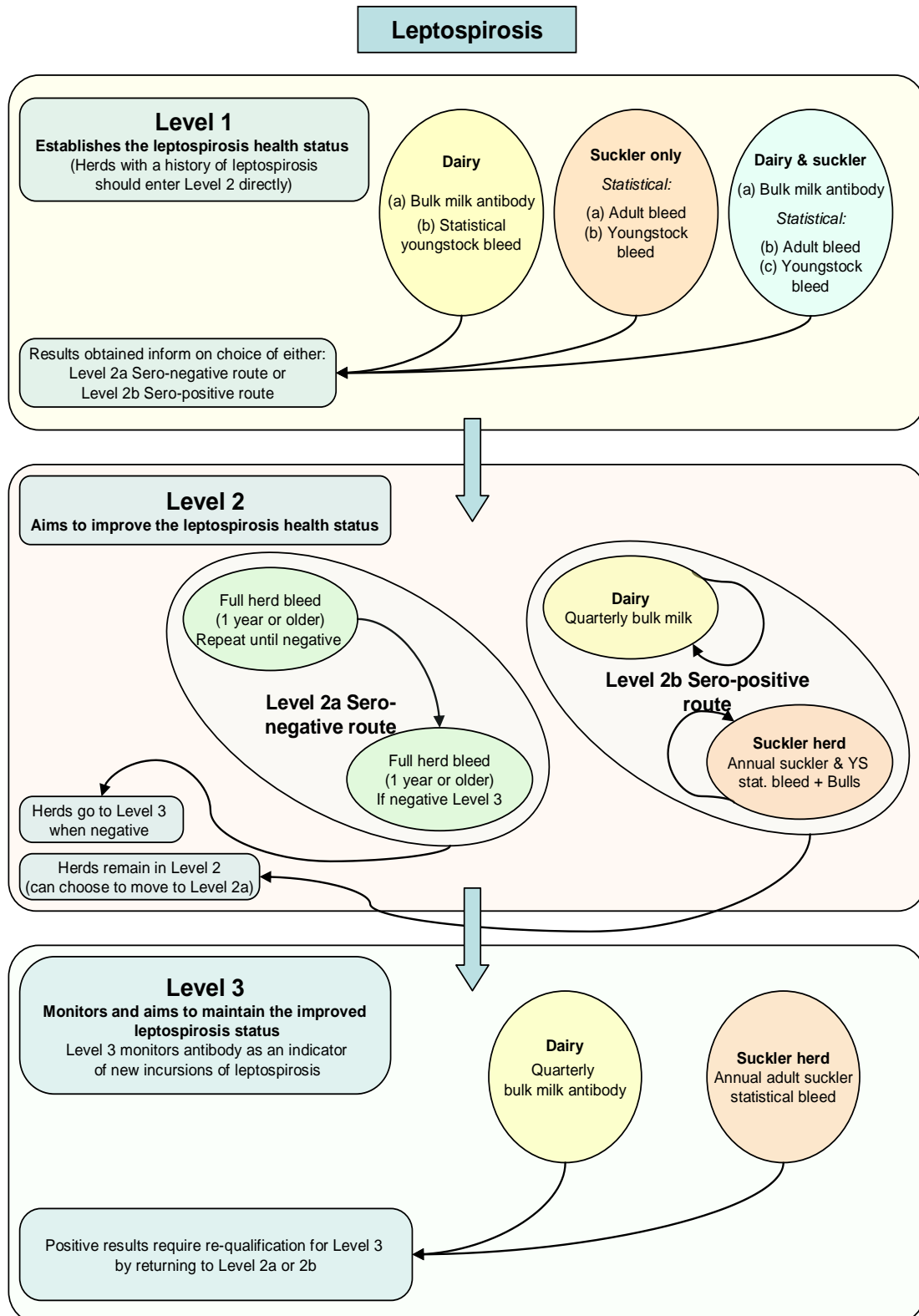
Where any of the Level 3 tests show positive antibody results, the herd will revert to Level 2.

### Investigation of clinical disease

Any episodes of clinical disease thought to be associated with *L. Hardjo* infection in a herd subscribed to any level of the Herdsure® protocol for leptospirosis should be reported to your veterinary practitioner who will arrange collection of appropriate samples for diagnostic purposes.

### 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.chees.co.uk](http://www.chees.co.uk)).



# HerdSure® protocol for IBR in cattle herds



## 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':

<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.

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.

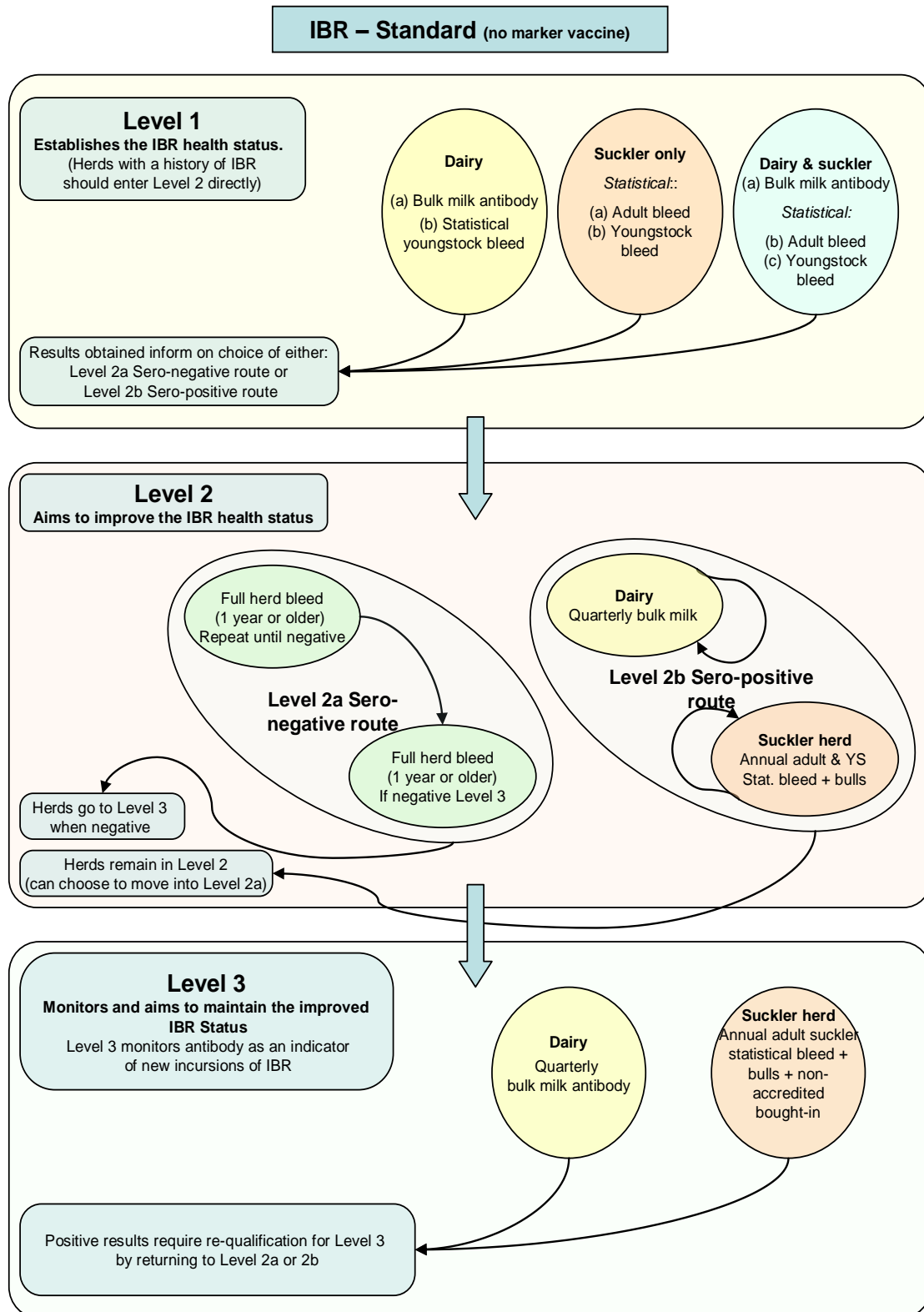
The number of cattle sampled for the milking cow herd, the suckler cow herd and for each management group of youngstock again depends on the size of the group. Your veterinary practitioner will calculate this using the same method used for Level 1. Breeding bulls and bought-in animals from non-accredited 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

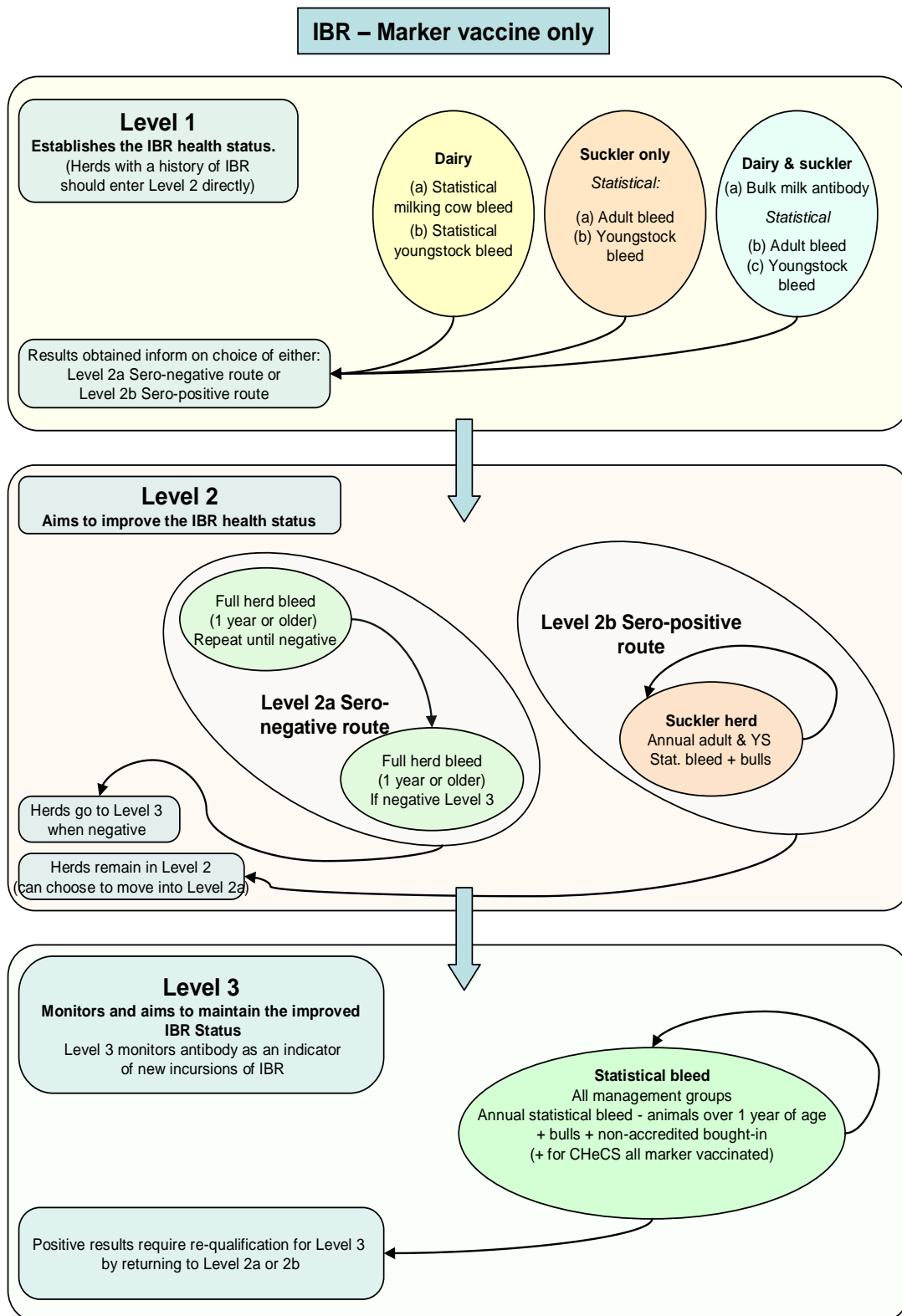
The Level 2a route is required for CHeCS accreditation. Herds are eligible for CHeCS accreditation at Level 3 following 2 consecutive clear herd tests at Level 2a.





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## HerdSure® protocol for neosporosis in cattle herds



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## Introduction

This protocol describes the processes used to establish the disease status for neosporosis in cattle and for the subsequent monitoring of neosporosis in those herds.

This protocol is suitable for both dairy and beef herds.

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

<b>Level 1</b>	Provides an indication of the herd's neosporosis status, based on a snapshot bleed or historical data.
<b>Level 2</b>	Aims to improve the health status of the herd for neosporosis.
<b>Level 3</b>	Monitors the herd's improved neosporosis health status.

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

## The disease

### Introduction

Neosporosis is a disease caused by a protozoan parasite, *Neospora caninum*, which occurs worldwide. Its major effect in cattle is abortion, although cattle can be infected without showing any signs.

### The disease

Neosporosis is the most frequently diagnosed cause of abortion in cattle in the UK, accounting for about 20% of cases diagnosed. As well as the direct cost of the loss of the calf, there may be other production losses such as reduced milk yield and fertility problems.

Cattle become infected in one of two ways:

- **‘Exogenous’ infection:** The main part of the parasite’s lifecycle is through dogs, which excrete the oocysts in their faeces. Cattle are infected when they eat the oocysts. Thus exposure to dog faeces in the environment, such as on pastures or in feed, is the main risk of this route of infection. Dogs can become infected by eating placenta or calf remains from an infected cow.
- **‘Endogenous’ infection:** Cattle that are already infected can pass the parasite on to their unborn offspring through the placenta (also called ‘vertical transmission’). These infected calves may be aborted. Alternatively they may be born with no abnormal signs but may carry the infection until they themselves become pregnant, when they will either abort or produce congenitally infected calves. Cattle infected this way remain infected for life. This is the main way in which the infection spreads within herds, i.e. from cow to calf. The disease does not spread from cow to cow.

*N. caninum* infection can enter herds either through environmental contamination by infected dog faeces or through purchase of infected animals. This means that control must include biosecurity measures that prevent exposure of the herd to dog faeces, prevent dogs from eating the products of calving and avoid purchase of infected animals.

### Tests for neosporosis

An antibody test is used to detect the immune response to *N. caninum* infection. Animals with an immune response (referred to as ‘sero-positive’) are six to seven times more likely to abort than those that are not. The level of antibody in the blood fluctuates during a cow’s breeding cycle and is highest 10 to 4 weeks **before** calving.

To be sure that an animal is not infected, it must have had **two** negative tests on blood samples taken between 10 to 4 weeks before calving in two pregnancies.

In addition, all abortions occurring on the farm must be investigated to rule out the involvement of neosporosis. Please contact your veterinary practitioner for further details.

## Biosecurity

Biosecurity refers to the actions taken to prevent disease entering or leaving a farm. There are some neosporosis-specific measures that must be undertaken as part of the Herdsure® protocol:

- dogs must not have access to the calving areas, including calving paddocks, or to placentas or dead calves. This includes farm dogs, visitors' dogs, foxhounds and those belonging to members of the public. Placentas, stillborn calves and carcasses should be removed as soon as possible from the calving areas to a secure location that is inaccessible to vermin such as foxes, badgers, rats and mice. They will then be removed by fallen stock contractors. This is necessary in order to prevent dogs gaining access to potentially infected material.
- feed stores, for both straights and forage, must be dog-proof to prevent contamination with dog faeces. It is also good practice to ensure they are vermin-proof to prevent possible spread of contamination by foxes, badgers, rats and mice.
- suppliers of feed should certify that measures to prevent contamination with dog faeces are in place at their premises.
- dogs access to pasture used for cattle grazing or for the production of cattle forage should be kept to a minimum because this could increase the risk of cattle becoming infected with *N. caninum*.

## 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 animals are one of the most likely ways to introduce infection to a herd. Minimising the number of added animals will keep the risk of introducing infection low. You should consider having a closed herd policy.

If possible, only buy animals that have been confirmed negative according to the Herdsure® protocol. These animals can be added without testing.

Cattle of 'unknown health status' can be introduced but they should be subject to testing as described below before they join the remainder of the herd.

Added animals should preferably be blood sampled at the farm of origin and antibody-positive animals should not be purchased. If this is not possible, added animals should be tested on arrival. If tested positive to *N. caninum*, they should be removed from the herd as soon as possible. Under no circumstances should any offspring be retained from them for introduction into the breeding herd.

Animals that give negative results cannot be regarded as free of infection on the basis of only one blood test. Antibody-negative animals should be regarded as *potentially* infected until they have achieved **two** negative blood tests taken between 10 and 4 weeks before two calvings. This could include the pre-purchase blood sample if taken in this period of gestation. Embryos must only be implanted into antibody-negative recipients.

## The protocol

### Level 1

#### Objective of HerdSure® testing

- Level 1 testing provides an indication of the herd's neosporosis status, based on a snapshot bleed or historical data.
- Level 1 also uses any herd history and history of relevant test results already held by the veterinary practitioner or by AHVLA, covering the last 12 months.
- where the history and test results indicate clear evidence of *N. caninum* infection in the herd in the last 12 months herds should enter the protocol at Level 2.

#### Sampling

The neosporosis status of the herd may already be known from previous investigations of abortions or blood tests.

If the status is not known, a '**snapshot blood test**' should be taken from **all** pregnant animals in the herd that are between 10 and 4 weeks of their expected calving date. This will indicate whether *Neospora* is present in the herd and give an indication of the proportion of cows that are infected. Your veterinary practitioner will be able to advise if this step is appropriate for your herd.

The herd should go directly to Level 2 if the *Neospora* status of the herd is already known or if there are not enough cows to carry out the 'snapshot bleed'.



## Level 2

### Objective of HerdSure® testing

- Level 2 testing aims to improve the health status of the herd by reducing the detrimental influence of neosporosis infection in the herd by identifying the cattle that are infected. Once identified, these cattle may be removed.

### Sampling

All female breeding animals in the herd should be blood sampled twice during the 10-4 week pre-calving window. As this is carried out over a period of time it is known as a '**progressive herd bleed**'.

These samples may be taken at the times shown in the table below.

Animals may be tested 10 to 4 weeks before their expected calving date, or following an abortion that occurs 10 to 4 weeks before their expected calving date. In addition, all abortions must be investigated to determine whether neosporosis was involved.

If either of the samples is positive, the animal is considered to be infected. Such animals must not be used for breeding replacements as these could also be infected. Infected animals should be removed from the herd at a time appropriate for the management of the herd (such as at the end of a lactation).

The herd cannot move to Level 3 until all positive animals have been removed.

## Level 3

### Objective of HerdSure® testing

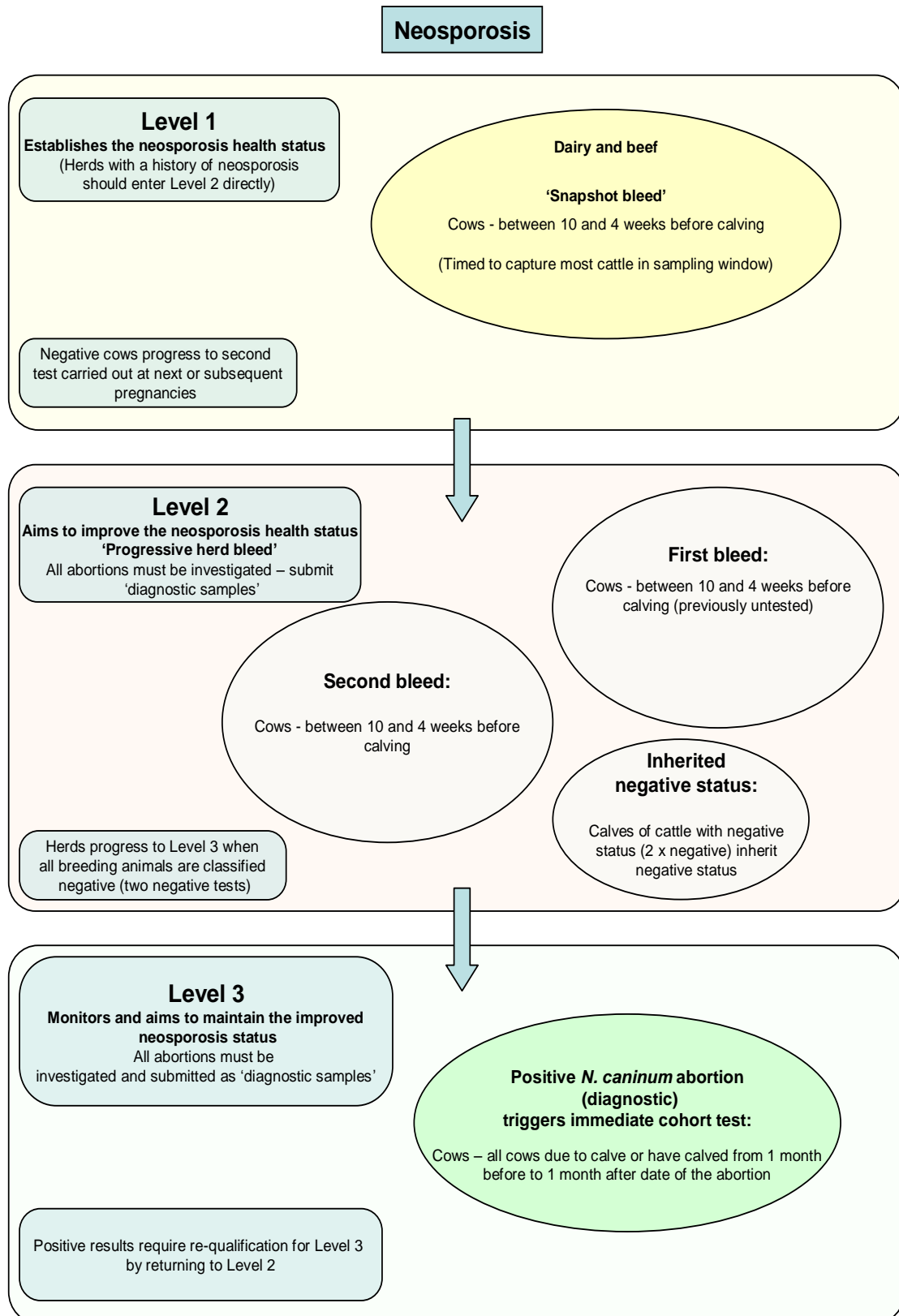
- Level 3 testing aims to monitor the herd's improved neosporosis health status.

### Sampling

During Level 3 all abortions must be investigated as for Level 2. This is a key part of the monitoring process and must be adhered to.

If *N. caninum* infection is found to have played a part in the abortion then the herd will revert to Level 2 while a herd investigation is carried out as follows:

- immediate blood sampling of all adult animals in the same group as the aborting cow. This group is defined as all animals which are due to calve or have calved from 1 month before to 1 month after the date of the abortion.
- if all of the cows and heifers in the group are negative, the herd may return to Level 3. Positive results in one or more animals in the group is suggestive of an external source of infection and means the herd restarts Level 2, and all the breeding animals must re-qualify for Level 3. This will mean that the 'free of neosporosis status' of all the breeding female cattle in the herd will be lost and the herd will begin sampling and testing for Level 2 again.
- farm biosecurity should be reviewed and, if necessary, improved following the likely re-introduction of neosporosis in order to identify potential risks and possibilities for disease entry.



## Glossary

<b>Annual herd progress reports</b>	An <b>annual herd progress report</b> 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.
<b>Antibody</b>	Produced by the body in response to challenge with a disease agent. Testing for antibody determines if the animal has either previously had the infection or has produced antibody in response to vaccination.
<b>Antigen</b>	Antigen usually describes an infectious agent or part of it that stimulates the production of antibodies. Antigen testing is used to determine the presence of the disease-causing agent.
<b>Beef cow, beef suckler cow or suckler cow</b>	An animal that has given birth to at least one calf and is used to suckle the calf or other calves.
<b>Biosecurity</b>	Measures to prevent the introduction, or re-introduction, of disease/infection onto the farm and into the herd.
<b>Breeding bull</b>	An entire male animal which is over 1-year-old and is, or is intended to be, used for breeding purposes.
<b>Bulk milk sample</b>	A bulk milk sample comprises milk from all cows currently lactating in the herd. Bulk milk samples are used for antibody detection in dairy herds for a number of Herdsure® diseases and, in the case of BVDV, are also used to detect persistently infected animals in the milking herd by PCR.
<b>BVD</b>	Bovine viral diarrhoea (BVD) describes diseases caused by infection with bovine viral diarrhoea virus (BVDV).
<b>BVDV</b>	Bovine viral diarrhoea virus
<b>CPH</b>	County Parish Holding number
<b>CTS</b>	Cattle Tracing Scheme
<b>ELISA antibody test</b>	This test is used to detect antibody in blood and milk samples and may be used to screen cattle for their exposure to BVDV, etc. Antibody may also be detected following vaccination. This is useful for measuring susceptibility.
<b><i>Fasciola hepatica</i></b>	The liver fluke parasite.
<b>Fasciolosis</b>	The disease caused by the liver fluke.
<b>Fluke egg detection</b>	A widely used test carried out on faeces to detect the eggs of adult liver fluke.

<b>Flukicide</b>	A treatment that kills liver fluke. Various drugs are available, some of which kill only adult fluke and some which kill both adult and immature fluke.
<b>Infectious bovine rhinotracheitis (IBR) also known as Bovine Herpes Virus-1 (BHV-1)</b>	A bovine herpes virus causing respiratory disease, milk drop and abortion. Once infected, an animal becomes a carrier and may be infectious to others at any time in life, particularly if stressed. Vaccination is an important control measure.
<b>Johne's disease</b>	A bacterial infection caused by <i>Mycobacterium avium</i> subspecies <i>paratuberculosis</i> (MAP). Present in the faeces of infected animals, it can survive for over a year in the environment. While infection usually occurs early in life, clinical signs may take several years to develop with progressive loss of condition, diarrhoea and decreased milk production.
<b>Known health status</b>	Programmed testing will determine the health status for the diseases within Herdsure® services. When considering replacement animals, it is important that these, where possible, are of equivalent or higher known health status to reduce the risk of introducing disease.
<b>Leptospirosis</b>	Leptospirosis is zoonotic, causing disease in animals and humans. The disease can cause milk drop, abortion and infertility. After the initial infection, the organism remains in the kidneys and reproductive tract and animals continue to be a source of infection for other stock.
<b>L. Hardjo</b>	The bacterium causing the disease known as leptospirosis.
<b>Liver fluke</b>	The liver fluke parasite infects grazing animals including cattle, sheep, deer, camelid species, rabbits, horses and, occasionally, humans.
<b>Marker vaccine (IBR)</b>	IBR marker vaccine allows testing to differentiate vaccine antibody from antibody produced by natural infection. The ELISA test used in conjunction with marker vaccine does not detect marker vaccine antibodies.
<b>Milking cow or dairy cow</b>	An animal that has given birth to at least one calf and is used for the production of milk.
<b><i>Mycobacterium avium paratuberculosis</i> (MAP)</b>	This organism causes the bacterial infection, Johne's disease, which may also be referred to as Paratuberculosis.
<b>Neosporosis</b>	Disease caused by the protozoan parasite <i>Neospora caninum</i> . It is one of the most commonly diagnosed causes of abortion in cattle in the UK.
<b>PCR</b>	Polymerase Chain Reaction (PCR) is a gene detection technology which identifies the genetic material of the target

organism. For BVDV, testing may be carried out from blood, milk and tissue samples.

<b>Persistently infected (PI)</b>	Infection with BVDV in the first third of pregnancy, when the calf has no functional immune system, means the calf cannot remove the virus and cannot produce antibody against the virus. The calf may not survive, resulting in abortion, but some are born and appear normal but are 'persistently infected' (PI). PI animals remain a source of infection as they excrete the virus for the rest of their lives.
<b>Protocol</b>	Herdsure® protocols define the steps and testing required for cattle health improvement.
<b>Registered herd</b>	A single holding with a single County Parish Holding number (CPH).
<b>Sero-positive</b>	A sero-positive animal is one where testing has identified the presence of antibody to the agent being investigated.
<b>Transient infection</b>	For Herdsure® services, this is the description of a BVD infection that occurs in susceptible animals and is usually of short duration, i.e. not a persistently infected (PI) animal.
<b>Triclabendazole</b>	A flukicide active against immature and adult fluke.
<b>TT</b>	Tuberculin Test – a skin test carried out in the field for TB control in cattle.
<b>Virus-negative</b>	Refers to animals tested for the virus (BVD) where no evidence of infection is found. These animals would be of low risk to others with regard to BVD.
<b>Virus-positive</b>	Refers to animals tested for the virus (BVD) where evidence is found. These animals are of high risk to others. BVDV-positive animals may be persistently or transiently infected.
<b>Youngstock</b>	All male and all female cattle (up to the birth of their first calf) from birth, regardless of breed or intended purpose. The only exception is breeding bulls over 1 year of age.
<b>Zoonotic</b>	A disease of animals that can be transmitted to humans.

## APPENDICES

## APPENDIX 1: Example of Form B

### Herdsure® Registration Form B Farm Details



**Please complete one Form B for each participating holding.**

Veterinary practice  
name

Name of responsible  
veterinary practitioner  
for future contact

Client's name

Client's  
correspondence  
address

Telephone No.

Fax No.

E-mail Address

CPH number of farm

Farm name and  
address (if different  
from above)

Type of farm  
*[please tick box(es)]*

Dairy: milking cows ☐

Beef: suckler cows ☐

Number of adult cattle  
(>30 months) currently  
registered on CTS

Where did you hear  
about Herdsure?

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1. To participate in Herdsure or Accreditation for disease free health status option [please tick box(es)]:

	Herdsure	Accreditation
<b>(CHeCS)</b>		
<b>Bovine viral diarrhoea (BVD) service</b>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Johne's disease service</b>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Leptospirosis service</b>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Infectious bovine rhinotracheitis (IBR) service</b>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Neosporosis service</b>	<input type="checkbox"/>	
<b>Liver fluke service</b>	<input type="checkbox"/>	

I wish to work towards CHeCS accreditation [please tick box] ☐ **Yes** (complete Form D) ☐  
**No**

2. Please tick the appropriate level for the holding to join the selected service based on criteria relating to the known disease status. If you are in any doubt please refer to your Veterinary Manual or contact the Herdsure helpline for further advice.

<b>Bovine viral diarrhoea (BVD)</b>	Level 1	[disease status not known]	<input type="checkbox"/>
	Level 2	[evidence of disease in last 12 mths]	<input type="checkbox"/>
<b>Johne's disease</b>	Level 1	[disease status not known]	<input type="checkbox"/>
	Level 2b	[evidence of disease in last 5yrs]	<input type="checkbox"/>
<b>Leptospirosis</b>	Level 1	[disease status not known]	<input type="checkbox"/>
	Level 2b	[evidence of disease in last 12mths and/or vaccinated]	<input type="checkbox"/>
<b>Infectious bovine rhinotracheitis (IBR)</b>	Level 1	[disease status not known]	<input type="checkbox"/>
	Level 2b	[evidence of disease in last 12mths and/or non marker vaccinated]	<input type="checkbox"/>
<b>Neosporosis</b>	Level 1	[disease status not known]	<input type="checkbox"/>
	Level 2	[evidence of disease]	<input type="checkbox"/>
<b>Liver fluke</b>	Level 1	[disease status not known]	<input type="checkbox"/>
	Level 2	[evidence of disease]	<input type="checkbox"/>

3. Please provide details of the current vaccination status of the herd: [please tick box(es)]

<b>Bovine viral diarrhoea (BVD)</b>	Vaccinated	<input type="checkbox"/>	Not vaccinated	<input type="checkbox"/>
<b>Johne's disease</b>	Vaccinated	<input type="checkbox"/>	Not vaccinated	<input type="checkbox"/>
<b>Leptospirosis</b>	Vaccinated	<input type="checkbox"/>	Not vaccinated	<input type="checkbox"/>
<b>Infectious bovine rhinotracheitis (IBR)</b>	Vaccinated	<input type="checkbox"/>	Not vaccinated	<input type="checkbox"/>
If vaccinated for IBR, was this a marker vaccine?			Yes	<input type="checkbox"/>
	No	<input type="checkbox"/>		<input type="checkbox"/>

Veterinary practitioner signature:

Date:

The purpose of this data is for the Herdsure Cattle Health Improvement Service. AHVLA may also use the data and the results produced for other purposes. Please see the data protection statement at [http://vla.defra.gov.uk/vla/vla\\_ati\\_dataprot.htm](http://vla.defra.gov.uk/vla/vla_ati_dataprot.htm).

#### Herdsure® Cattle Health Improvement Service

Animal Health and Veterinary Laboratories Agency

PO Box 653, Newcastle upon Tyne, NE12 2ET

Helpline: 0300 303 1556 Fax: 0191 266 3605

Email: [Herdsure@ahvla.gsi.gov.uk](mailto:Herdsure@ahvla.gsi.gov.uk) Web: [www.ahvlascientific.com](http://www.ahvlascientific.com)



The Animal Health and Veterinary Laboratories Agency is an executive agency of the Department for Environment, Food and Rural Affairs, working across Great Britain on behalf of Defra, Scottish Government and Welsh Government.

## APPENDIX 2: Example of a Herdsure® Form D

### Herdsure® Form D Accreditation Application & Compliance Declaration



This form is only relevant to clients seeking accreditation for disease free health status with Cattle Health Certification Standards (CHeCS). This form should be completed at registration and submitted to Herdsure along with Form B. This form should also be completed and submitted with all Herdsure submissions for a herd seeking accreditation for disease free health status.

**IMPORTANT** this form must be returned fully signed by both the Owner/Manager and Veterinary Surgeon

#### To be signed by the Owner/Responsible Manager of the herd:

I wish to become a member/continue as a member (delete as applicable) of Herdsure and apply for accreditation for disease free health status for the following diseases.

BVD ☐

Johne's ☐

Lepto ☐

IBR ☐

The biosecurity rules and sampling and management actions for the control of these diseases as described in Herdsure manual and CHeCS technical document are being implemented in this herd. I understand that Herdsure may inspect the herd, premises and herd records in order to verify compliance with the scheme rules and that evidence of failure to comply may result in the loss of herd status.

Signed:

Farm/Trading Name:

Name:

CPH Number:

Date:

Address:

#### To be signed by the veterinary practitioner:

I have explained accreditation for disease free health status to my client who is, to the best of my knowledge, complying with the required rules and conditions.

Signed:

Practice Name:

Name:

Address:

Date:

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Web: [www.ahvlascientific.com](http://www.ahvlascientific.com)



## APPENDIX 3: Example of a Herd Progress Report

### Herdsure® Herd Progress Report



Animal Health and Veterinary Laboratories Agency PO Box 653, Newcastle upon Tyne, NE12 2ET  
Email: Herdsure@ahvla.gsi.gov.uk

The Herd Owned by: \_\_\_\_\_

Kept at: \_\_\_\_\_

Holding no: \_\_\_\_\_

Signed on behalf of the Animal Health and Veterinary Laboratories Agency annually.  
All samples have been tested in accordance with Herdsure® protocols:

Protocol	Level	Protocol	Level
BVD		Johne's disease	
Leptospirosis		IBR	
Liver fluke		Neosporosis	

Signed: \_\_\_\_\_

Name: \_\_\_\_\_

Date: \_\_\_\_\_

#### With regard to diseases specified above:

Level 1 – establishes the disease status of the herd

Level 2 - improves the health status of the herd

Level 3 - monitors and aims to maintain the improved health status

To be signed optionally by the person responsible for management of the herd.

The biosecurity recommendations and management actions for the control of the enrolled Herdsure® protocols, listed above as described in the Herdsure® handbook, have been implemented in this herd.

Signed: \_\_\_\_\_

Name: \_\_\_\_\_

Date: \_\_\_\_\_

**Please retain for your records. Not to be used as a sales certificate.**

Additional copies of this report may be requested at any time for a small fee

## Appendix 4: Example of a Results Report



**Cattle Health  
Improvement Service**  
PO Box 653, Newcastle upon Tyne,  
NE12 2ET  
Helpline: 0300 303 1556



Any Veterinary Hospital  
252 Any Road  
Anytown  
RB12 7JB

Contact: Joe Swift

### Herdsure® Report

#### BVD Level 2 Step BD2a – Bulk milk PCR

Request reference	HS00003-09-09
Farm & CPH	Home Farm 01/123/1234
Sample/Tests	Bulk milk / TC0709 – Viral RNA in milk PCR
Verdict	<b>Negative</b>

#### Verdict Interpretation

##### Step BD2a (Negative)

**PCR on bulk milk has proved negative therefore blood testing of all cattle over 30 days old on the holding can begin, Step BD2d. A sampling worksheet is attached.**

#### TC0709 (†) Results

Sample	Sample Ref	BVD PCR Bulk Milk Result
HS11-13699	Bulk Milk	Negative

John Williams  
Responsible Officer  
07, April 2011

‡ - Test subcontracted; opinions given and interpretations of the result are outside the scope of UKAS accreditation.  
† - Not UKAS accredited; opinions given and interpretations of the result are outside the scope of UKAS accreditation.  
For further details of the test methods used, and other terms and conditions, please refer to the VLA Website.



## APPENDIX 5: Example of a Sampling Submission Worksheet



Cattle Health  
Improvement Service  
PO Box 653, Newcastle upon Tyne,  
NE12 2ET  
Helpline: 0300 303 1556



**J Bloggs and Son**  
Any Veterinary Hospital  
252 Any Road  
Anytown  
RB12 7JB  
Contact: John Smith

**Date: 10, January 2011**

### Herdsure® Sampling Worksheet

#### **Johne's Level 1 Step J1a – Full Adult Bleed**

**Note: This form MUST be submitted with the samples**

<b>Request Reference</b>	HS0010-01-11	HS0010-01-11
<b>Farm &amp; CPH</b>	A. B. Taylor	
<b>Sample Required</b>	Blood	
<b>For Test</b>	TC0366 – Mycobacterium Paratuberculosis Ab ELISA	
<b>Required by</b>	07/02/2011	
<b>Enclosed</b>		
<b>Instructions</b>	Please collect blood samples (red top) from all breeding animals over 2 years of age.  An ear tag list of cattle over 2 years of age is provided.	

Data Protection Act 1998: In addition to recording the information on this form onto the Herdsure Management System, we may also use the data provided for other purposes. Please see the data protection statement on our website [www.vlascientific.com](http://www.vlascientific.com).

—This slip can be removed and retained for your records—

#### **Herdsure Sampling Worksheet**

**Activity – Johne's Level 1 Step J1a – Full Adult Bleed**

<b>Request Reference</b>	HS0010-01-11
<b>Farm &amp; CPH</b>	A. B. Taylor
<b>Sample Required</b>	Blood
<b>For Test</b>	TC0366
<b>Required by</b>	07/02/2011
<b>Enclosed</b>	

## APPENDIX 6: Example of a Sampling Worksheet – Ear Tags Annex



**Cattle Health  
Improvement Service**  
PO Box 653, Newcastle upon Tyne, NE12 2ET  
Helpline: 0300 303 1556



### Herdsure Sampling Worksheet – Ear Tags Annex Johne's Level 1 Step J1a – Full Adult Bleed

**It is important that samples submitted to the laboratory are annotated in such a way as to make them clearly traceable to an animal or management group. The following options can be used:**

- (1) Write the animal ID on the vacutainer tube and annotate the ear tag list accordingly.
- (2) Write the vacutainer tube number onto the ear tag list (or a partial vacutainer number if appropriate). Please ensure when using non-sequentially numbered vacutainer tubes that no duplication of numbers occurs.

For option (2), enter first Vacutainer Number

Ear tag barcode	Ear tag	CTS age	Sample identifier
UK226257300001	UK226257300001	6y 10m	
UK226257500003	UK226257500003	6y 9m	
UK226257600004	UK226257600004	5y 8m	
UK226257300001	UK226257300001	5y 8m	
UK226257100006	UK226257100006	4y 9m	
UK226257200007	UK226257200007	4y 6m	
UK226257300008	UK226257300008	3y 7m	
UK226257600011	UK226257600011	3y 5m	
UK226257200012	UK226257200012	5y 1m	
UK226257100120	UK226257100120	5y 6m	
UK226257500200	UK226257500200	5y 9m	

## APPENDIX 7: Sampling instructions

### Bulk milk collection (applicable to liver fluke and BVD)

A pre-labelled sample collection pot, preservative and packaging have been provided to allow for the collection of a bulk milk sample.

- Collect a bulk milk sample of 25 ml (a full pot) from the bulk milk tank in the sampling pot provided. **NB:** Do *not* dip the sampling pot with preservative into the bulk tank. See the separate safety guidelines for preservative that will be issued with the pots.
- The pot contains a small amount of preservative which will make the milk turn slightly blue; this is normal and will not affect the performance of the test.
- Firmly replace the lid (it is advised to seal the lid with insulation tape in order to avoid leaks).
- Place the sample pot inside the plastic transport container provided and snap shut.
- Place the sample and submission request form back into the envelope and seal with tape. Affix the postage-paid Business Reply label - this covers the full postage cost.
- Post the package back to the testing laboratory.
- The test results will be returned to you via your nominated veterinary practice.

(**NB:** The safety advice that accompanies the bottles should be adhered to.)

### Pooled faeces collection (applicable to liver fluke)

Pre-labelled sample collection pots (40), sampling spoons and packaging have been provided to allow for collection of faeces samples.

- Collect 5 g of faeces (2 teaspoonfuls) of faeces from either pens or field from at-risk cattle on farm.
- Place the faeces sample into the sampling pot provided and firmly replace the lid.
- Repeat this sampling until all 40 pots contain a 5 g sample. (Select different sites around the pens/field in order to cover a range of at-risk animals.)
- It is advised to seal the lid with insulation tape in order to avoid leaks.
- Place the pots back into the box provided, along with the submission request form.
- Seal the box with tape and affix the postage-paid Business Reply label - this covers the full postage cost.
- Post the package back to the testing laboratory.
- The test results will be returned to you via your nominated veterinary practice.

## Collection of individual milk samples (applicable to BVD – for laboratory examination by PCR)

### ***Follow this procedure to avoid contamination:***

1. Wash and dry your hands thoroughly.
2. Only wash the teat to be sampled if it is obviously dirty and then dry it immediately.
3. Discard the first four to five draws of milk.
4. **Clean the end of the teat even if you have just washed and dried it:**
  - a) Use a small piece of cotton wool soaked in surgical spirit (80% spirit / 20% water).
  - b) Wipe the end of the teat with the cotton wool until it is completely clean.
5. **Take the sample:**
  - a) Open the sample bottle – **keep the lid clean** – never place the lid open-side down and preferably hold it in the crook of your little finger.
  - b) Hold the sample bottle at an angle to the teat.
  - c) Discard a further draw of milk.
  - d) Fill the sample bottle to at least half-full.
  - e) Replace the lid carefully. Seal the universal with tape if necessary.
6. **Label the sample bottle** – with the cow's ear tag or other unique identifier. Make sure that the ID corresponds with the Herdsure Sampling Worksheet.
7. Send the samples using the Pre-paid address label to AHVLA Herdsure® Cattle Health Improvement Service, PO Box 653, Newcastle upon Tyne, NE12 2ET

**(NB:** Whenever the bottle for the milk sample contains preservative or a preservative is added to the bottle, the safety advice that accompanies the bottles or preservative should be adhered to)



## **Appendix 8: Collection of individual milk samples for PCR examination in pools of 10**

This procedure will be used following a positive PCR bulk milk sample. The purpose is to identify smaller groups of cows, which may include the cow, or cows that are responsible for excretion of virus in their milk and therefore into the bulk milk sample. By doing this it is possible to reduce the number of cows requiring BVD antigen testing.

For this test milk should be collected individually from each cow of the group by expressing approximately 5–10 ml of milk directly from the teat, taking care to avoid cross-contamination.

All the samples collected in this way will be pooled in the testing laboratory. Cross-contamination of samples will not result in the inaccurate identification of viraemic cows as the animals in positive pools will be individually blood sampled for BVD antigen. It may, however, result in additional false positive pools with additional antigen testing becoming necessary as a result.

Where two separate bulk milk tanks are in use on a farm, it will be possible to provide two separate bulk milk samples in the first instance. By doing this it may be possible to exclude one part of the herd from individual milk sampling. If this option is chosen, a Herdsure® consultant should be informed before submitting the samples. It is important that the animals contributing to each bulk milk sample are accurately identified and that their identities are annotated on the worksheet accompanying the samples.