

*The SAC Premium Cattle Health Scheme (PCHS) is organised and supervised by the Veterinary Science Division of the Scottish Agricultural College in partnership with practising veterinary surgeons. It seeks to identify herds free from certain diseases and to offer a control programme for those herds in which the diseases have been identified.*

*In this brochure the programmes are outlined, but the full technical document is available on request and will be provided to members of PCHS.*

## THE NEED FOR A CATTLE HEALTH SCHEME

*Certain infectious diseases reduce the efficiency of production and adversely affect animal welfare in both dairy and beef cattle. The presence of some of these diseases within the national herd may also compromise consumer confidence in the final product. The major way infectious disease is introduced to a cattle herd is animal movement, but many breeders continue to purchase high value breeding stock of unknown health status. Indeed even the purely commercial beef herd must buy breeding bulls.*

*Health schemes offer a way to overcome these disease problems. Essentially a health scheme is a set of management rules and a disease testing programme which shows whether or not a particular disease is present in the herd. It also offers a way to control and eliminate the disease from the herd that not only improves the productivity of the herd but also allows the sale of breeding animals known to be free of the disease in question.*

*SAC's Premium Cattle Health Scheme (PCHS) focuses on four diseases: Bovine Virus Diarrhoea (BVD), Johne's disease, Infectious Bovine Rhinotracheitis (IBR) and Leptospirosis. This reflects the importance of these diseases not only within this country but also worldwide. The Scandinavian countries have already successfully taken steps to eradicate BVD from their national herd. Australia, Canada and the USA have well established Johne's disease herd programmes and Switzerland, Denmark, Finland and Sweden have eradicated IBR while other countries have started to do so. If we fail to follow, then once the BSE induced ban on the export of live cattle is lifted, we will find our cattle are of an inferior health status and no longer saleable in these countries.*



# PREMIUM CATTLE HEALTH SCHEME - THE OBJECTIVES

- To eliminate specific diseases from cattle herds
- To identify herds free of specific diseases and to provide breeding cattle of certified health status
- To prevent the introduction of specific diseases to herds free of the diseases
- To monitor changes in disease status to allow timely control or preventive action to be taken.

## WHY CHOOSE SAC'S PREMIUM CATTLE HEALTH SCHEME?

SAC Veterinary Science Division (VSD) has operated a network of veterinary diagnostic laboratories throughout Scotland for many years. During that time considerable expertise has been built up and close links have been forged between SAC vets, the farming communities and the vets in practice. SAC also has more than 10 years experience in running National Health Schemes for other ruminant species. We have a team of vets with considerable practical experience of the diseases covered by the Premium Cattle Health Scheme and believe we can provide you with the best advice available.



## HOW DOES THE HEALTH SCHEME WORK?

For each disease there is a testing programme and a list of rules and conditions which must be met. You will find outlines of each disease in this brochure. Your own vet collects any samples which are required and certifies that the herd conditions are met. Once the test results are known, SAC vets in conjunction with your own vet will offer advice on what action is required. SAC vets will also issue certificates once the herd has been shown to be free of the disease.

## HOW MUCH DOES THE SCHEME COST?

An annual membership fee is levied to cover administration costs, payable in full for the first disease and with an increment for any subsequent disease. See price list for details.

Laboratory tests are charged on a 'per test' basis and a price list is available.

You will also have to pay your own vet for collecting the samples and for providing advice.



## HOW DO YOU JOIN?

If you feel these control programmes fit in with the business objectives for your herd and you can satisfy the conditions set out in the rules you should discuss your own particular situation with either your own vet or one of SAC's vets (see page 13). To enrol please complete an application form and send it to:

Health Scheme Bureau  
PO Box 5557  
Inverness  
IV2 4YT

Tel: 01463 226995  
Fax: 01463 711103



# THE DISEASES & PROGRAMMES

## BOVINE VIRUS DIARRHOEA (BVD)

*Bovine virus diarrhoea virus is closely related to the viruses that cause classical swine fever in pigs and border disease in sheep. This virus causes a complex of diseases in cattle the most important of which interfere with reproduction, affect the foetus and lead to mucosal disease. BVD virus can also cause enteritis during acute or transient infection which is usually mild but occasionally severe enough to kill even adult cows. Transient BVD virus infection is also believed to cause significant suppression of disease resistance and may contribute to the pneumonia complex in calves.*

*Infection immediately before or during the breeding season will reduce conception rates and cause early death of the embryo. Infection at any stage of pregnancy can result in abortion. The virus can also cause deformities in the calf. However of particular importance is infection in the first third of pregnancy when developing calves that survive remain **Persistently Infected with the virus (PI calves)** and it is these calves, once born, that provide the major route of spread for this virus. They often appear normal but always shed virus throughout their lives. Many develop a fatal enteritis known as mucosal disease before they reach maturity, however, significant numbers of PIs survive well into adulthood. Semen from transiently infected bulls can also spread infection. Theoretically other ruminant species, such as sheep and deer, can be a source of infection for cattle although sheep are at greater risk from cattle than vice versa. Contaminated needles and other equipment can also spread virus from animal to animal and herd to herd. Therefore careful herd health security and quarantine are an essential part of control (see page 11).*

*The economic losses for an uncontrolled outbreak of BVD can be very great. It has been calculated that in a large beef herd these can exceed £45,000 over a ten year period while losses can be greater in the dairy herd. In most outbreaks reproductive losses are the most significant although mucosal disease cases are the most obvious.*

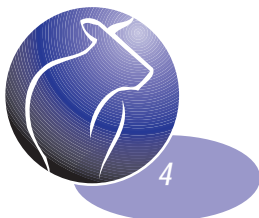
*Where possible control by identification and removal of PI animals is advised with subsequent exclusion of any potential sources of reinfection. Screening is by ELISA test for antibody on blood or bulk milk with secondary screening of animals with low or negative antibody for virus, also using ELISA tests. In some herds where potential sources of reinfection cannot be excluded vaccination might be the only viable option although this is likely to be expensive and protection of the herd may be incomplete. Vaccination may also be used in the course of an eradication programme, particularly in beef herds.*

## BVD SCREENING AND ERADICATION PROGRAMME

**Initial Assessment:** Where the BVD infection status is unknown we recommend that samples from 10 animals are collected from each distinct management group in the age range 9 – 18 months. These are tested for the presence of antibody to BVD and, if positive, it indicates that infection is active in the herd. If negative it is the first step to accreditation. If animals are sold off the herd before 9 months of age, calves in the age range 6-9 months should be sampled instead. In the dairy herd bulk milk screens and first lactation screens can offer additional information.

**Eradication:** Once BVD infection is confirmed in the herd all animals over 4 months of age are screened once and then all animals born subsequently for a period of 12 months after the removal of the last virus positive animal are also tested. This is usually achieved through two tests 12 months apart. Animals are individually tested for antibody and any with low or negative levels are then tested for virus. Once virus positive animals are confirmed by a second test they are removed from the herd.

We follow up to check the success of eradication by repeating the testing described under the Initial Assessment (above) on two calf crops. If these show no evidence of infection the herd is considered free of BVD.



## BVD ACCREDITATION PROGRAMME

Accreditation follows on from either a negative initial screen or after the eradication procedures are complete. Testing is essentially the same procedure as the initial assessment, repeated at annual intervals and, after two clear tests, the herd is awarded the status 'accredited free of BVD infection'.

Milk can be used to replace blood samples for antibody testing in lactating cows and bulk milk samples can be used as part of the accreditation procedure where the initial assessment of the dairy herd shows no evidence of infection. In this latter case three clear bulk milk tests at 7 month intervals allow accreditation of freedom from BVD.

## ANNUAL TESTING

To maintain accreditation the same test procedure described in the initial assessment is repeated each year. Bulk milk samples or samples from first lactation cows are also tested three times a year in the dairy herd.



## **INFECTIOUS BOVINE RHINOTRACHEITIS (IBR)**

*Infectious bovine rhinotracheitis is an acute virus disease that principally affects the upper respiratory tract and can lead to fatal pneumonia. In adult cows infection is associated with a severe and prolonged drop in milk yield, reduced fertility and abortions. The virus is usually shed in secretions from the respiratory tract but can also be spread in the semen of infected bulls. Once an animal has become infected it remains so, despite the development of an effective immune response and thereafter these animals can shed virus at any time in their lives when stressed. Movement of such animals into a herd is often the source of new infections. Vaccination is an effective means of control, but this does not stop infected animals from shedding the virus at a later date.*

*The diagnostic test used on blood samples is an antibody ELISA which detects the animal's response to previous infection. This test cannot differentiate between antibodies stimulated by the 'wild' IBR virus from those stimulated by the live vaccines licensed for use in the UK. For this reason vaccination using the vaccines currently available is not an option when seeking to eradicate the disease from a herd.*

*However, when gene-deleted vaccines become available in the UK, it will be possible to distinguish between positive antibody reactions caused by exposure to wild IBR infection and those caused by the gene-deleted vaccine. This will change the whole approach to IBR control, as vaccination will then become an option when attempting to eradicate IBR from a herd, and the IBR programme will then be updated.*

*Despite the effect this disease has on animal health and productivity its main significance is as a barrier to the export of live cattle to other regions or countries within Europe which have already eradicated the disease. In future, in order to gain access to these markets, herds will have to be able to prove freedom from IBR.*

## **IBR SCREENING AND ERADICATION PROGRAMME**

Initial Herd Screen: In herds where the IBR status is uncertain limited blood sampling or bulk milk antibody testing can be carried out as an aid in deciding whether to progress with eradication of this disease. Once you have decided to eradicate the disease, all animals of 8 months of age or older must be sampled. Animals which test positive are reactors and should be removed. If there are too many reactors to remove in one go we will advise on the appropriate strategy to follow.

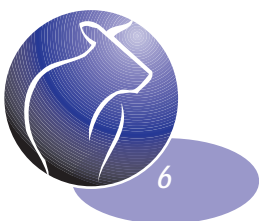
Once reactors are removed a second herd test is carried out between 3 and 12 months later. This is repeated until a clear test is achieved.

## **IBR ACCREDITATION PROGRAMME**

To show freedom from the disease all that is required are two clear tests of all animals of 8 months of age or over. The second herd test can follow at 4 weeks and up to 12 months after the first clear test.

Once accredited you must test a statistically based sample of animals of 2 years of age or over each year.

Individual milk samples can be used to replace blood samples in lactating cows.



## JOHNE'S DISEASE

*This disease is a chronic, progressive, wasting condition that affects ruminants and is caused by the organism *Mycobacterium avium* subspecies *paratuberculosis*. Strains of the organism appear to be specific to the different species of ruminants and if cross infection does occur it does so rarely. The infectious agent is shed in large numbers in faeces; it can be found in colostrum and can pass into the womb to infect the developing calf. Animals are infected by ingesting the agent and young animals are considered to be the most susceptible to infection, however clinical signs of diarrhoea and weight loss usually occur some time after 18 months of age. In heavily infected herds this leads to a high rate of wastage in cattle at two to four years of age. Infection is nearly always introduced to a herd by purchasing infected replacement breeding stock, including bulls.*

*The absorbed ELISA for the detection of serum antibody (blood test) and the culture of the bacterium from faeces are both valuable tests for the diagnosis of Johne's disease, however they can only be used to detect infected animals in the later stages of the disease, once clinical disease becomes apparent and for a short period prior to this.*

*This means a simple test and cull programme is not enough and it must be supplemented by the removal of offspring of any positive dam from the breeding herd in an effort to exclude animals before they show signs of the disease. Because of the difficulties with testing and because the infection can survive in the environment for a limited time, control and eradication is more difficult than for the other diseases in the scheme. However the on-going losses due to the disease and the risk to herds purchasing cattle from infected herds means that an effort should be made to eradicate the disease from infected herds.*

*Vaccination is useful in heavily infected herds to reduce the number of cases and therefore to reduce the amount of infection in the environment. Vaccination will not remove the infection from the herd, but it is an aid in the control of Johne's disease. There is likely to be an increasing need for herds that sell breeding stock to be accredited free of Johne's disease.*

## JOHNE'S DISEASE SCREENING AND ERADICATION PROGRAMMES

Herd Test: For Johne's disease all animals of 2 years of age and over are blood sampled. In herds where there has been no previous evidence of the disease we would follow up any positive animals by examining faeces for the organism. Otherwise all reactors are removed. The offspring of any cows which react should also be removed from the breeding herd and their current calf not retained for breeding.

The herd test is repeated each year, although for maximum progress this interval can be reduced to six months, until a clear test is achieved.

## JOHNE'S DISEASE MONITORED FREE PROGRAMME

To be monitored free from disease two clear tests of all animals of 2 years and over are required at an interval of one year. As the incubation period for Johne's disease is measured in years it is not possible to give an absolute assurance of freedom from infection until many years have passed. That is why the programme is called Johne's disease monitored free.

The herd test is carried out every second year and all cull cows are tested in the intervening year. Where it proves impractical to test cull animals a full herd test must be carried out annually.

(Milk samples cannot be used to replace blood in the tests for Johne's disease.)



## LEPTOSPIROSIS

*Leptospirosis is associated with infertility and abortion in both beef and dairy herds and has been identified as a cause of milk drop. The disease is caused by the organisms collectively referred to as *Leptospira hardjo* (*L. borgpetersenii* serovar *hardjo* and *L. interrogans* seriovar *hardjo*). After infection these bacteria localise in the reproductive tract and in the kidneys. The agent is passed in urine and infection spreads when cattle are exposed to urine from infected animals. As with other diseases included in the PCHS, disease is nearly always introduced into the herd by the purchase of infected cattle. Infection may also be introduced by contaminated water supplies. *L. hardjo* can be maintained in sheep but does not appear to cause disease in sheep; however sheep may be a source of infection for cattle.*

*Of more importance is the risk of infection in man where infection causes flu-like symptoms and severe headaches. Dairy men working in the parlour are most at risk of exposure to infected urine. Herd owners must therefore be aware of their responsibilities under the COSHH regulations.*

*Confirmation of infection in premature or stillborn calves is difficult, but evidence of infection in the herd can be gained by blood sampling the cows. In the scheme the ELISA test is used to detect antibody in the blood or milk. Some cows only test positive for a short time after infection. Another problem lies in the fact that other types of *Leptospira* organisms can infect cattle and result in a positive blood test while causing no disease.*

*These two features mean that a test and cull policy is not a reliable option for control. But where testing in a herd shows no evidence of disease, breeding stock from a herd can be considered to be free of infection and be purchased safely. It is for this reason that some herds may wish to pursue accreditation of freedom from disease or monitor for the presence of disease.*

*Where a herd test shows evidence of infection some owners may wish to enter a monitoring programme to help them manage the disease. Alternative options for a herd with evidence of active infection include vaccination and medication.*

## LEPTOSPIROSIS ACCREDITATION PROGRAMME

Once a herd is infected with leptospirosis, vaccination is the recommended route to follow. We do not offer an eradication programme for this disease.

To show freedom from this disease all cattle of 2 years of age or older and all animals intended for breeding that are one year or older are tested twice at an interval of 3 to 12 months. Thereafter each year a statistically based sample of animals of two years and older must be sampled.

Individual milk samples can be used to replace blood samples in lactating cows.

## MONITORING PROGRAMMES FOR BVD, IBR AND LEPTOSPIROSIS

These programmes are based on the examination of milk samples at three month intervals for antibody to BVD, IBR or leptospirosis. The results can then be used by the herd manager and his veterinary surgeon in the assessment of herd health and fertility. A change from a negative to a positive result can be used as a trigger for implementation of further control programmes.

(At present the tests for Johne's disease cannot be used with milk samples)





# An Outline of RULES for SAC PREMIUM CATTLE HEALTH SCHEME

## Screening and Eradication Programmes for BVD, IBR and Johne's Disease

We advise herds to follow both the rules of the PCHS and the principles of Herd Health Security (page 11). If this is not done then any effort made in screening and removal of reactors will yield little in the way of long term benefit.

## Accreditation Programmes for BVD, IBR and Leptospirosis and Johne's Disease Monitored Free Programmes

As herds will be certified either free of infection or in the case of Johne's disease – the disease itself, it is imperative that all PCHS rules are followed and the principles of Herd Health Security embraced. Failure to do so will not only jeopardise the health status of the herd, but will prevent certification of accreditation of freedom or monitored free status.

## Monitoring Programmes for BVD, IBR and Leptospirosis

In these programmes there is no need to follow any of the PCHS rules or adhere to the principles of Herd Health Security. However, our firm recommendation is that by doing both the health of the herd will benefit.

## RULES: THE SUMMARY

- A herd is defined as cattle that are under a unified management system not necessarily on one premises.
- Farm boundaries must prevent cattle from straying off or onto the farm and must prevent nose to nose contact over fences or walls. Double fencing with a space of 3 metres between their cattle and neighbouring cattle is required for BVD and IBR programmes.
- In the Johne's disease and leptospirosis programmes cattle must not have access to water which has flowed through another farm.
- Purchased cattle that are of an inferior health status either from within or without the scheme must enter quarantine for the required period and be tested by the appropriate test(s) for the disease(s) in question.
- Equipment, livestock trailers and handling facilities that are shared between health scheme cattle and other livestock or non-health scheme cattle must be cleaned and disinfected before use by health scheme cattle.
- Suitable quarantine facilities in the form of pens or paddocks which do not allow contact with other farm livestock must be available for cattle coming into the herd. These facilities must conform to part 2 of the Herd Health Security Document. (see page 11)
- Samples can only be collected by
  - i) a veterinary surgeon
  - ii) someone designated by the veterinary surgeon who is not the owner of the cattle nor an employee of the owner
  - iii) in the case of milk samples by the milk recorder.

Where the herd uses more than one bulk tank, representative samples must be collected from each tank and tested separately.

- Any disease condition which might be attributable to the disease which is the target of the programme must be investigated by the owner's own veterinary surgeon.



- It should be recognised that any contact with other stock puts the status of the herd at risk. As there is no PCHS accredited section at cattle shows and sales any accredited cattle attending a show or sale will be deemed to have lost their accredited status. On being returned to the herd of origin such animals must be treated as non-accredited animals and must be isolated and tested according to the requirements of the individual disease programmes.
- SAC Veterinary Science Division strongly recommends that members' veterinary surgeons should be members of the British Cattle Veterinary Association and attend SAC Veterinary Science Division Premium Health Scheme vet workshops.



# Appendix I

## Herd Health Security for Cattle

Herd Health Security means the measures taken to prevent the introduction of infectious agents which cause specific diseases in a herd of cattle.

- Any cattle from herds of unknown disease status must be assumed to be a potential source of disease.
- Health Security can never be absolute, however, the risk of introducing disease is directly related to the extent of the measures taken and the degree to which they are applied.

## Health Security: General Measures

These are measures applicable to the control of most infectious diseases; they represent good husbandry standards and adoption should be attempted by all health conscious cattle farmers.

- 1 Where it is necessary to purchase replacement stock avoid infected cattle by acquiring from herds certified free of specific diseases (ie accredited).
- 2 Quarantine facilities should be provided for all added animals. These should prevent contact with other stock and neither air space, drainage nor dung storage should be shared with other cattle. A dedicated building separate from other cattle buildings is ideal, but a separate paddock which prevents contact with other stock may suffice. It is also advisable to discuss with your vet any screening tests which must be carried out and ensure that animals are inspected regularly for signs of disease. A quarantine period of 4 weeks is sufficient for most diseases.

Dung from the quarantine facility should not be disposed of onto pasture which is to be grazed by cattle within 12 months. Similarly where paddocks have been used for quarantine purposes they must not be grazed by other cattle within 12 months.

- 3 Avoid all contact either direct or indirect (eg dung or urine) with cattle from infected farms (eg at shows, at markets, in transit, over fences, on rented grazings). Where contact has occurred animals should enter quarantine on return to the farm.
- 4 Avoid introduction of infection on clothing or footwear (eg AI technician, vets, neighbours, hoof trimmer) or equipment (eg vehicles, crushes, dosing equipment). Dedicated clothing, footwear and equipment for a particular farm are the safest option. A less secure though acceptable alternative is thorough cleaning and disinfection of clothing, footwear and equipment before use on the farm at risk. Single use disposable overalls and disposable foot covers should be used for casual visitors. Vehicles should be cleaned and disinfected with an appropriate disinfectant before they are used for cattle unless they are moving direct to a slaughter house. Particular effort should be made to clean and disinfect any equipment likely to be contaminated with blood (eg hoof knives, instruments for castrating, disbudding or dehorning). Injection equipment should never be shared between farms. Veterinary surgical equipment must not be shared between farms unless it is sterilised before use.
- 5 Limit farm access to those people deemed essential.
- 6 Limit and control access of vehicles to the farm. Delivery and pick up points should be at a site isolated from the cattle and at the boundary of the farm. Where possible the driver should remain in his cab and should certainly never assist in removing cattle from pens unless using farm dedicated overalls and footwear.
- 7 Use piped mains water rather than natural water sources whenever possible.
- 8 Prevent access of vermin and wildlife to feed and bedding stores and the cattle whenever possible.



- 9 As purchased feed and bedding constitute a risk of introducing infection it is important to use reputable suppliers.
- 10 Embryos and semen should be from donors of disease free status.
- 11 Sheep can harbour some of the diseases which affect cattle and therefore contact between cattle and sheep should be avoided. This is particularly important at housing when cattle should not share the same building with sheep. If at all possible cattle and sheep should not graze together. The dung from sheep sheds should not be spread onto fields to be used for cattle and cattle should not be allowed access to water courses which have sheep grazing upstream.

#### Measures to prevent introduction of infectious agents causing specific diseases

If the introduction of specific diseases (eg IBR, BVD, Leptospirosis or Johne's disease) is to be prevented, such as in a health scheme, the health security must be tailored to these diseases. Details of specific preventative measures for diseases included in the Premium Cattle Health Scheme are found in the comprehensive set of rules available on request. Most of these measures are in fact included in the general section above, however, different routes of spread are more important for some diseases than others. For example, airborne spread is much more likely with IBR than Johne's disease. So there is a requirement in the rules for 3 metre spaced double fencing bordering neighbouring farms for the IBR scheme but not the Johne's disease scheme. A quarantine period of 4 weeks suffices for IBR, BVD and Leptospirosis but not for Johne's disease where 4 months is required.



SAC supports PCHS with a team of vets who have proven track records and many years experience in the field of cattle disease diagnostics and consultancy.

George Caldwell is manager of the Premium Cattle Health Scheme and Regional Veterinary Manager for the South East of Scotland. George has worked for 16 years in advisory and consultancy services for cattle health, first with the MLC and then with SAC. His objective is to ensure PCHS delivers maximum benefit to the cattle industry and to service the consultancy needs of his PCHS clients in the East of Scotland and those from outwith Scotland. George also provides the technical expertise for the Johne's Disease programme.

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George Gunn is manager of SAC's Epidemiology Unit and has been a long time advocate of herd health programmes to improve cattle production efficiency. George joined SAC in 1984 after working in dairy cattle practice. George shares with Sheila Rusbridge in the management of PCHS clients in the North of Scotland and provides technical support for the BVD programme.

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Mark Crawshaw joined SAC in 1992 and manages PCHS clients in the West of Scotland. Before joining SAC Mark spent 9 years in general veterinary practice latterly as a partner in a dairy cattle practice in the south of England. Throughout his career Mark's primary interest has been management of the health, welfare and productivity of cattle at the herd level. Mark provides the technical support for the IBR programme and the herd health security programme as well as the management of PCHS clients in the West of Scotland.

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Sheila Rusbridge joined SAC in 1993 after spending time researching into aspects of cattle fertility following a period in cattle practice. Sheila shares with George Gunn in the management of PCHS clients in the North of Scotland and provides technical support for the Leptospirosis programme.

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