

Biosecurity advice and Cattle purchasing checklist



Contents

- 3 Introduction**
- 4 Diseases for consideration when purchasing cattle**
- 9 Isolation**
- 10 What do health screening blood test results mean?**
- 12 Conclusions**
- 13 Glossary**
- 14 Cattle purchasing disease checklist**

Thanks go to K L Cutler MRCVS for the initial inspiration for this document and for his ongoing input to help ensure it remains a valued resource.



Introduction

Biosecurity is a word that has become firmly embedded in the agricultural vocabulary. In most cases, its meaning is interpreted as referring to the precautions that should be taken to prevent the introduction of disease onto a holding. In fact, biosecurity means much more than this.

The term biosecurity actually embraces a complete concept of risk assessment and reduction which is aimed at maintaining and improving the health and, therefore, welfare, productivity and profitability of the herds and flocks that contribute to our livestock industry.

One has only to look at the variety of ways in which animals are kept and managed on our farms to immediately appreciate that it is impossible to produce a set of biosecurity rules that are applicable in every case.

No two farms are the same in terms of environment, management or endemic disease profile. The risks faced by the livestock on each farm will, therefore, be different and it will only be possible to minimise these risks by the implementation of a unique action plan. This should be drawn up, following careful consideration, using the benefit of veterinary advice with the total involvement of farm staff.

Possibly the greatest threat to the health status of an established herd is the introduction of new animals. A potential threat also exists to the new animals when they are introduced into an established herd. In order to reduce the risks involved when purchasing stock, various questions should be asked and, during a period of isolation, tests carried out and prophylactic vaccines and treatments given, where appropriate. Before this is done, however, if sensible cost-effective decisions are to be made, it is essential that the current health status of the herd is fully appreciated and a veterinary health plan is in place and not just for farm assurance purposes.



Derek Armstrong, AHDB Lead Veterinary Science Expert



British Cattle Veterinary Association wish to see a central role for the vet to safeguard and improve the wellbeing of cattle and safety of our food within sustainable beef and dairy industries. Mission – what we do:

- We represent the views of members in the wider livestock industry
- We provide and promote lifelong learning
- We promote cattle wellbeing (health and welfare)
- We provide a community for cattle vets in the UK to belong and share ideas and knowledge



CHeCS was established by the cattle industry in 1999 as a form of quality control for disease management programmes. Its aim is to create robust common standards to underpin the control and eradication of the main endemic cattle diseases in the UK and Ireland. This means CHeCS does not provide or manage health schemes itself – but it provides the standards for those that do and wish to be licensed.

Diseases for consideration when purchasing cattle

The list is, of course, almost endless. Some diseases are, however, more significant than others, although different diseases may be important for different reasons; some have zoonotic implications, some have serious consequences in different situations, in terms of animal welfare, others can result in a significant compromise in productivity and profitability. The relative importance of the various diseases will depend on the health status of the herd into which the purchased cattle are to be introduced, so it is advisable to work with your vet to assess priority in your situation.

Bovine Tuberculosis (TB)

Bovine TB is a bacterial disease that results from infection with *Mycobacterium bovis*. Infection can occur by inhalation or ingestion of the infectious organism. Both direct transmission between cattle and the involvement of wildlife vectors are implicated in the pathogenesis of bovine TB. In cattle, it can cause coughing and a loss of condition, but its primary importance is because of its zoonotic potential.

The control of bovine TB relies on mandatory testing at intervals, directed by the State Veterinary Service. All testing instructions should be complied with.

In order to reduce the risk of introducing bovine TB into your herd when purchasing cattle you should:

1. Request details of the testing history of the herd of origin of the purchased animals and, in particular, when the last test was carried out, the results of that test and whether TB has ever been confirmed in that herd. Testing details from premises contiguous with the herd of origin of the purchased animals would also be useful.
2. Obtain permission to carry out a private TB test on any purchased animals and keep the purchased animals in isolation until the results of the test are known.

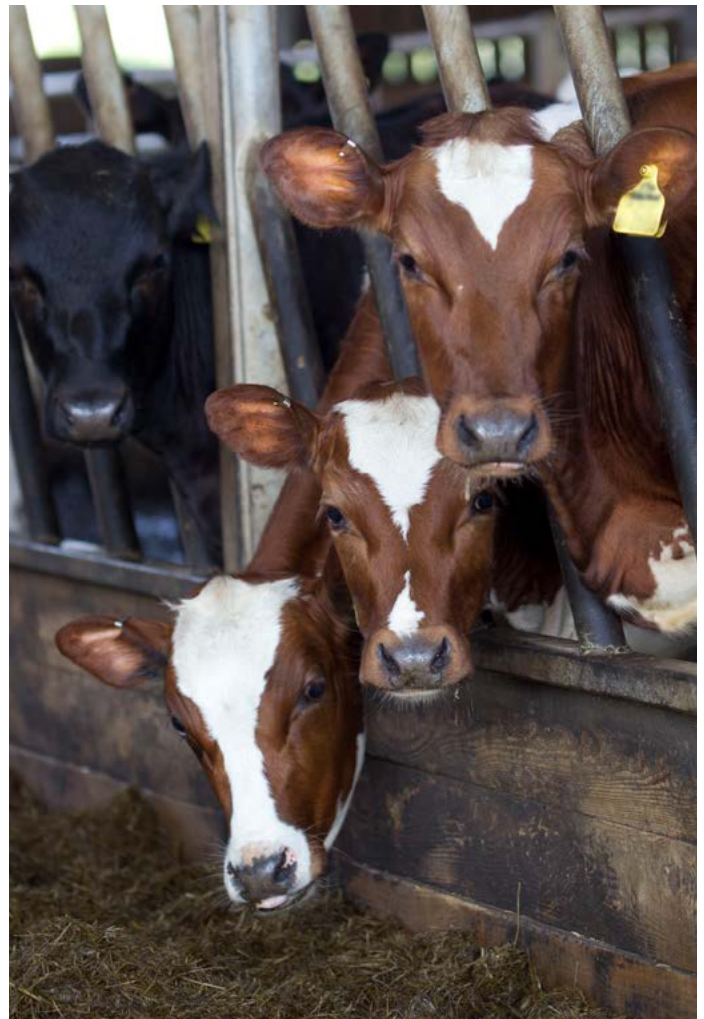
Consider pre-movement and post-movement testing for TB before adding animals to your herd. Check current statutory requirements for movements and testing at www.tbhub.co.uk

Johne's disease

This is another mycobacterial disease caused by *Mycobacterium avium paratuberculosis* (Map). Infection usually occurs early in life, but there is a long incubation period and clinical signs, chronic scouring and progressive weight loss, are not usually seen until an infected animal is several years old.

Reducing the risk of introducing Johne's disease into a herd when purchasing cattle presents particular problems, partly because of the long incubation period between infection and the onset of clinical signs, and partly because of the limitations of the laboratory tests available to detect Map infection. If cattle are to be purchased, the risk can, however, be reduced by sourcing them from a certified Johne's disease low-risk herd. Animals that have been vaccinated against Johne's disease should be avoided. Vaccination implies that the herd of origin is infected and although vaccination does delay the onset of clinical signs and reduce their severity, it does not prevent infection and transmission.

The Cattle Health Certification Standards scheme (CHeCS) certifies levels of risk for Johnes, ie herds are not accredited 'free'. More information can be found within the CHeCS Technical Document at www.checs.co.uk



Bovine Viral Diarrhoea virus (BVD)

BVD is a complex viral disease of cattle that can cause an array of clinical signs and significant economic loss. Perhaps the most important consequences of infection are its effects on reproductive function and on the immune system. Infection during pregnancy may result in the loss of that pregnancy, in the production of a deformed calf or in the production of a persistently infected calf. Infection at any time will result in compromised immune function, allowing other infectious diseases to cause greater problems than they otherwise might have done.

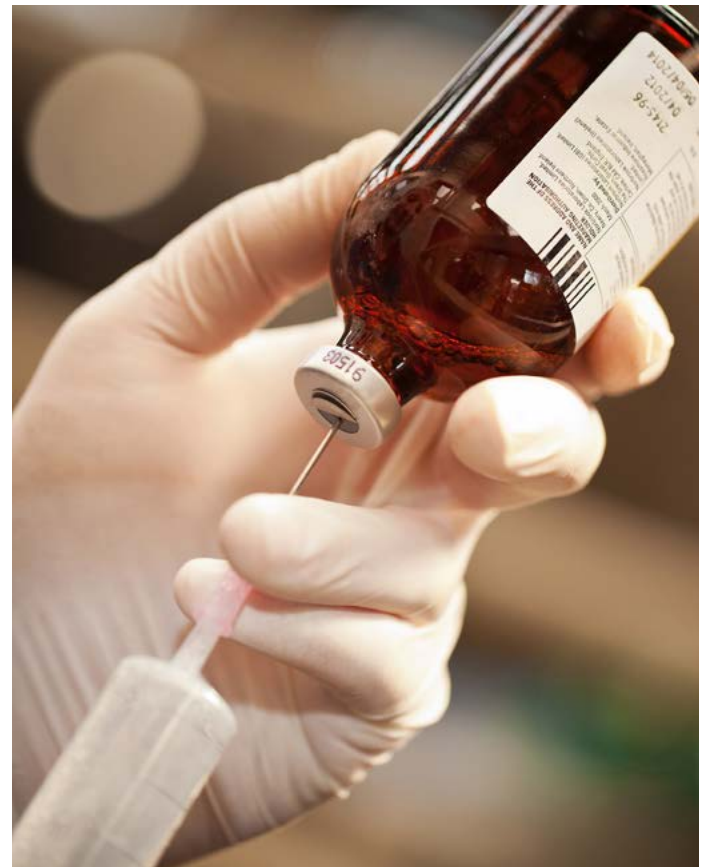
Cattle can be infected following contact with transiently or, more commonly, persistently infected animals. Around 70 per cent of persistently infected (PI) animals will die within two years of birth, many from mucosal disease which results in chronic, irreversible scouring. A small number of PI animals can survive and spread BVD infection in herds for years.

In order to reduce the risk of introducing BVD into the herd when purchasing animals, take the following action:

1. Determine the health status of the herd of origin of the purchased animals with respect to BVD; whether it is certified free of BVD or whether it is vaccinated. If it is not vaccinated, the screening history of the herd should be determined.
2. Keep purchased animals in isolation until the results of testing for BVD virus is known. (Vaccinated animals should be tested to ensure a virus negative status.) During this time, the purchased animals should be vaccinated, if appropriate.
3. Reject persistently infected animals.
4. Appreciate the risk posed by animals that are pregnant or that have a young calf at foot because of the possibility of the foetus or young calf being persistently infected, even if the dam is not. (Ideally, such animals should not be purchased.)

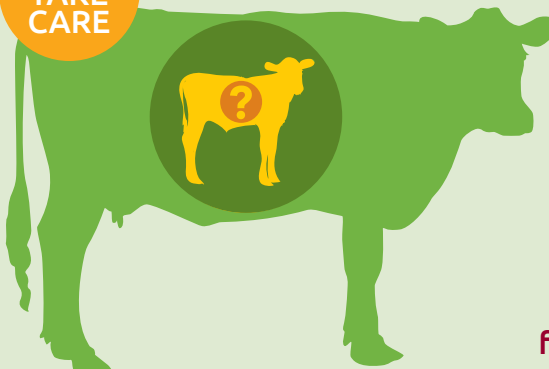


ENGLAND



The BVD status of cattle tested under the scheme are searchable at bvdfree.org.uk, by entering a UK tag number or CPH. Farmers must register with BVDFree for test results to be uploaded to the national database. Visit bvdfree.org.uk to join the scheme.

**BUYER
TAKE
CARE**



Buying pregnant cattle?

All pregnant cattle will carry a calf of **UNKNOWN** BVD status.

Isolate these animals from your herd and TEST THE CALF for BVD virus once born.

Infectious Bovine Rhinotracheitis (IBR)

IBR is a viral disease of cattle that can cause respiratory disease, reproductive failure and milk drop. Once infected, a carrier status is often established without any obvious clinical signs. Such animals can become infectious again and therefore pose a risk, particularly at times of stress.

To reduce the risk of introducing IBR into your herd when purchasing animals, take the following action:

1. Determine the health status of the herd of origin of the purchased animals with respect to IBR; whether it is certified free of IBR or whether it is vaccinated. If it is not vaccinated, the screening history of the herd should be determined. If it is vaccinated, the type of vaccine used (conventional or marker vaccine) should be determined.
2. Keep purchased animals in isolation until their IBR antibody status can be determined.
3. Don't introduce vaccinated animals into an IBR-free herd (unless a marker vaccine has been used and antibody testing shows no evidence of exposure to the virus). Vaccinated animals can still carry and spread IBR.



Bluetongue (BTV)

There are several distinct strains of bluetongue virus that can affect cattle and other ruminants, causing disease of varying severity. The strain of bluetongue virus which is currently of greatest concern in the UK is BTV8, although BTV1 also poses a threat, BTV6 has been recorded in northern Europe and BTV4 has now been reported in France.

Bluetongue viruses are transmitted between susceptible animals by midge vectors. Controlling midges, therefore, offers a possible means of controlling the spread of these viruses. Disease prevention, however, relies more on vaccination, although vaccines produced against one strain of bluetongue virus will provide little or no protection against the other strains.

To reduce the risk of introducing bluetongue into your herd, take the following action:

1. Ideally, only purchase stock from outside a designated protection zone.
2. Ensure all purchased animals originating from within a protection zone have been fully vaccinated, tested to confirm their bluetongue status and treated with an appropriate topical insecticide prior to being purchased.

In the event of a bluetongue outbreak occurring in the UK, specific advice can be found at www.gov.uk

Leptospirosis

Leptospirosis is a bacterial disease. In cattle, the causative organism, *Leptospira hardjo*, localises in the kidney and reproductive tract. Spread between cattle is, therefore, mainly via the urine and uterine discharges from infected animals. The major consequences of disease are reproductive failure (infertility and abortions) and reduced milk yield (flabby bag).

Leptospirosis has a significant zoonotic potential. In humans, the usual signs of clinical disease are a flu-like illness although a potentially fatal meningitis has also been reported.

In order to reduce the risk of introducing leptospirosis into your herd when purchasing cattle, take the following action:

1. Determine the health status of the herd of origin of the purchased animals with respect to leptospirosis; whether it is certified free of the disease or whether it is vaccinated. If it is not vaccinated, the screening history of the herd should be determined.
2. Keep purchased animals in isolation until the results of tests to determine their leptospirosis status are known and appropriate prophylactic antibiotic therapy has been given. During this period of isolation, the purchased animals could, if appropriate, be vaccinated.

Campylobacteriosis

Campylobacter fetus is a sexually transmitted bacteria that colonises the anterior vagina of infected cows and the preputial folds of infected bulls. It is passed from cow to bull to cow at serving, so its significance is greater in herds relying totally on natural service or in herds that run a sweeper bull, than in herds in which AI only is used. Infected cows, in the absence of a bull, will eventually develop an immunity to the organism and eliminate the infection but infected bulls will only eliminate the infection following treatment, which is not easy nor always successful. Infection with *Campylobacter fetus* can cause infertility and abortions.

In order to safeguard a herd against the introduction of *Campylobacter fetus*, only virgin animals should be sourced. Females of unknown or uncertain reproductive history should be avoided. If there is no alternative to sourcing a non-virgin replacement bull, it should be treated with prophylactic antibiotics and have its prepuce washed daily for three consecutive days using a specially prepared antibiotic solution.

Neospora caninum

Neospora caninum is a protozoal organism that can be passed to cattle in the faeces of infected dogs or from infected cows to their offspring. Infected cattle have a higher probability of aborting than uninfected herd contemporaries.

To reduce the risk of introducing this organism into a herd, the antibody status of all purchased animals should be determined and seropositive animals should be rejected. It is also good practice to inquire as to whether the source herd has previously been diagnosed with *Neospora*.

Salmonellosis

A variety of salmonella organisms can affect cattle. The two most common cattle associated salmonellae are *S. typhimurium* and *S. dublin*. These can cause enteritis and septicaemia of varying severity. *S. typhimurium* in particular can cause severe disease resulting in abortions, dysentery and even death. *S. dublin* is a common cause of bovine abortions. Asymptomatic infections and a 'carrier' status also exist.

As with other salmonellae, *S. typhimurium* and *S. dublin* have a zoonotic potential.

Screening purchased animals is probably of limited value in safeguarding the health of your herd. Culture of faeces and possibly other samples would, however, be recommended should any recently purchased animals become ill, show signs of diarrhoea or dysentery, or abort. It is also good practice to inquire as to whether the source herd has previously been diagnosed with Salmonella.



Brucellosis

Brucella abortus causes infected cattle to abort. In non-immune herds, it can spread rapidly resulting in abortion storms. It also has zoonotic potential and causes 'undulant fever' in infected people.

The control of brucellosis is the responsibility of the State Veterinary Service. The status of British herds is monitored by regular testing. There is also a requirement to report all bovine abortions to Defra who will then arrange for the aborted animal to be tested, should that be considered necessary.

Britain is currently regarded as officially brucellosis-free by the EU. Not all European countries have this health status. If purchased cattle are imported, the health status of their region of origin should be ascertained and blood tests carried out at the time of import and first calving after being imported to ensure freedom from disease.

Mycoplasma bovis

Mycoplasma bovis is a bacterial disease which causes a range of clinical signs, of which the most common are pneumonia, middle ear disease - presenting as an ear droop or head tilt, arthritis and mastitis. Both adult cattle and young stock can be affected. The disease can easily be spread by the purchase of carrier animals, although it must be recognised that the purchase of non-immune, non-infected cattle into an endemically infected herd may also be a significant disease risk.

No vaccine for this disease is available. Keeping a closed herd, if possible, is the best advice.

Parasites

It is advised that all purchased animals are treated to remove gastrointestinal worms, lungworm, liver fluke, lice and mites, before they are introduced into an established herd. It is also advised to ask if anthelmintic resistance has ever been diagnosed in the source herd.



Isolation

Before the introduction of purchased cattle (whether they be bulls, dairy cows, beef cows, replacement breeding stock, stores or calves) into your herd, they should be isolated for a period of quarantine. While in quarantine, they should be observed carefully to ensure they do not develop any signs of infectious disease. During the time they are kept in quarantine, the various tests, vaccinations and prophylactic treatments that have been agreed with your veterinary surgeon can be carried out.

Isolation in this context means no direct contact between any purchased cattle or their by-products and your own herd. Ideally, any purchased cattle should be housed in a separate building from your own stock.

If this is not possible, a distance of at least three metres should be maintained between the purchased stock and your own cattle. Purchased stock isolated at grazing should be kept in a separate field to your own stock with a gap of at least three metres between the purchased stock and any other cattle to prevent any direct nose-to-nose contact.

Lactating dairy cattle present a special challenge while being quarantined because of the need for them to be milked. In this situation, they should be brought into the collecting yard and parlour only after all other cattle have been milked and returned to their buildings or fields. After the purchased cattle have been milked, the parlour and collecting yards should be thoroughly cleaned as normal.



What do health screening blood test results mean?

Determining the health status of animals offered for sale is not an exact science. Laboratory tests detecting either antigen (the infectious agent) or antibody (the body's response to the infectious agent) are useful but must be interpreted with care if the correct conclusions about an individual animal's health status are to be reached.

BVD

Antibody positive – an animal that has tested positive for antibodies to BVD has either been transiently infected at some time or vaccinated. It cannot be persistently infected. In most cases, such an animal can be considered 'safe', but pregnant animals require special consideration.

Antibody negative – an animal that has tested negative for antibodies to BVD has either never been exposed to the disease (or exposed only in the very recent past), nor vaccinated, or is persistently infected with the virus. Reassurance of the antigen status of antibody negative animals should be sought prior to purchase.

Antigen positive – animals testing positive for BVD antigen have virus circulating within their body. They may be either transiently or persistently infected. Further testing will be required to establish this with certainty. Unless this is carried out, they should not be purchased.

Antigen negative – in calves less than six months of age a negative antigen test result does not guarantee freedom from infection because of the possibility of persisting maternal antibodies interfering with the test results (unless a PCR test has been used).

IBR

Antibody positive – an animal that has tested positive for antibodies to IBR has either been infected with this virus or vaccinated. It is impossible to establish which is the case unless a marker vaccine has been used and so infection should be assumed.

As a consequence of infection, it will be probable that the animal is still carrying the virus and may excrete it at intervals in the future, posing a threat to the health status of any IBR-susceptible animals it is in contact with.

Antibody negative – an animal that has tested negative for antibodies to IBR has never been exposed to this virus, nor vaccinated. As such, it can be considered 'safe' although it may be at considerable risk itself if it is mixed with other animals which may be carrying IBR.

Leptospirosis

Antibody positive – an animal that has tested positive for antibodies to leptospirosis has either been exposed to infection or vaccinated. It is currently not possible to determine which of these is the case. If the animal has been exposed to infection, it is possible it may still be carrying infectious organisms in its urinary or reproductive tract. It may, therefore, pose a threat to the health status of any animals with which it is mixed.

This risk can be reduced by the appropriate use of antibiotics and vaccination.

Antibody negative – an animal that has tested negative for antibodies to leptospirosis should not be carrying this disease and can usually be considered 'safe'. It may, however, be at risk of infection itself if it is mixed with animals carrying this disease.

(Occasionally antibody titres may decline while excretion of the infectious organism continues. A knowledge of the health status of the animal's herd of origin may provide greater reassurance about the individual's health status).



Johne's disease

Tested positive – animals that have tested positive for Johne's disease by any method (antibody detection, faecal microscopy, faecal culture or PCR) present a considerable health risk to other cattle and should not be purchased.

Tested negative – a single negative test result for Johne's disease, by any method, in the case of an individual animal is relatively meaningless, particularly in young animals. Greater reliance can be placed on negative test results in older animals or if multiple tests have been carried out over a period of time. A risk of false negative results still, however, remains and no animal can be considered 'safe' on the basis of individual testing.

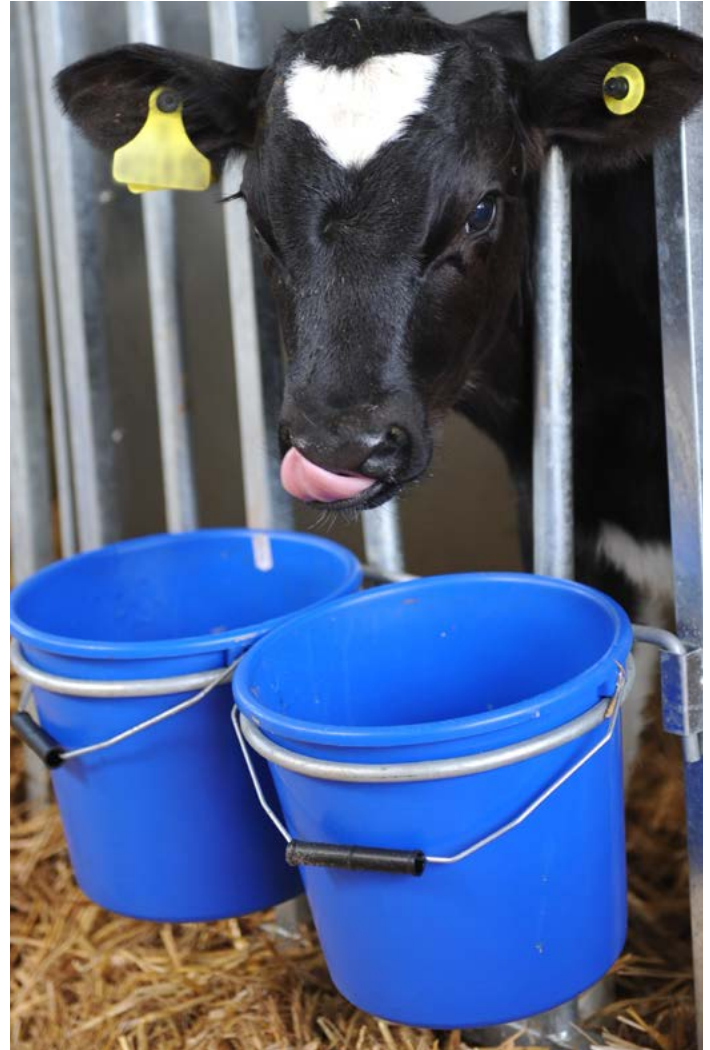
Herd monitoring of the herd of origin provides greater reassurance of an individual animal's probable freedom from Johne's disease with the greatest possible (although still not certain) reassurance being provided by Johne's disease Risk level 1 accreditation as defined by CHeCS, especially if this accreditation has been maintained over a number of years.

Interpreting Johne's Disease Serology – although most animals that develop Johne's disease are infected with Map, the causative organism, within the first few weeks of life, the incubation period of the disease is long and clinical signs are not usually seen until the animal is between three and five years old. Antibodies to Map, which can be used to confirm the presence of infection, take a similarly long period of time to develop and are rarely detectable, even in infected animals, before two years of age. If they are detected, the result is almost always (in more than 99 per cent of cases) significant, indicating that the animal from which the sample came is infected with Map and is almost certain, in time, to develop Johne's disease. If antibodies are not detected, this may be because the animal from which the sample was taken is not infected with Map, but it may also be that the animal is infected and is destined to suffer from clinical Johne's disease later in its life but which, at the time the sample was collected, was in the early stages of the disease and had not produced a detectable level of antibodies. A negative Johne's disease antibody result does not, therefore, mean that the animal from which the sample was collected is not infected with Map.

Mycoplasma bovis

Antibody positive – an animal that has been exposed to the bacteria and has produced an antibody response. It may or may not itself be a carrier of the organism.

Antibody negative – an animal that has not been exposed to the bacteria.



Bluetongue

Antibody positive – an animal that has tested positive for antibodies to the Bluetongue virus has either been exposed to infection or vaccinated. It is unlikely to be carrying virus but this cannot be guaranteed without further testing.

Antibody negative – an animal that has tested negative for antibodies to the Bluetongue virus has neither been exposed to the virus (unless exposure has occurred very recently) nor vaccinated.

Virus positive – animals testing positive for the Bluetongue virus by PCR still have virus circulating within their body. They should not be purchased.

Conclusions

Throughout the discussion above, relating to specific pathogens and diseases that may pose a threat to herd health, welfare and productivity, various recurrent themes stand out. These can be summarised as four key points:

1. Know the health status of your own herd.
2. Know what you are buying.
3. Quarantine purchased animals.
4. Assess and then act to reduce the risks posed by and to the purchased animals.

It is important to ascertain, as far as is possible, the status, not only of the animals you are buying but of their herd of origin as well. This knowledge, in conjunction with an awareness of the health status of the existing herd, will allow the risks of introducing animals into an established herd, both to that herd and to the animals to be introduced, to be assessed. An appropriate course of action designed to minimise these risks can then be determined.

Purchased animals should be kept in isolation for a variable period of time, depending on the risk assessment. During this time, they should be watched closely for any signs of disease and, if these are noticed, they should be investigated fully to determine their cause. A period of isolation will also provide time during which any testing, treatment or vaccination that is deemed necessary can be carried out.

Since every situation is unique and because it is impossible to adequately address every possibility without a detailed knowledge of the exact situation, it is advised that veterinary advice is sought when purchasing cattle to assist in each risk assessment and in the formulation of a strategy to minimise the perceived risks.



Glossary

Antibody – the product of an immune response by the body to an antigen aimed at controlling and possibly eliminating infection

Antigen – the part of an infectious organism (virus, bacteria, etc) against which the body's immune system reacts by mounting an immune response

Contiguous – neighbouring

Latent infection – an infection which lies dormant within the body without causing any clinical signs but which can become reactivated, usually at times of stress, causing new outbreaks of disease

Pathogenesis – how an infectious organism spreads and causes disease

Persistent infection – an animal that is born infected and remains infected for its entire life

Prophylactic – preventative

Sero-negative – an animal that does not have circulating antibodies to a specific organism indicating it has never been exposed to nor infected with that organism (or vaccinated against it)

Sero-positive – an animal that has produced antibodies that continue to circulate in its blood indicating previous exposure to or infection with a specific organism (or vaccinated against it)

Transiently infected – infected for a period of time, limited by the host's immune response, which eliminates the infection

Zoonotic – an infection which is transmissible from animals to humans



Cattle purchasing disease checklist

It is recommended that the **Cattle purchasing disease checklist** (located in the pocket overleaf) is used as an aide-memoire when discussing any proposed cattle purchase with your veterinary surgeon.

The diseases, which should not be considered a comprehensive list, may, if purchasing cattle, have implications for the health of the herd. Equally, the health status of the herd may have implications for the well-being of the purchased cattle.

An attempt has been made to prioritise the diseases listed in a potential order of importance. This will, however, vary according to individual circumstances.

Your veterinary surgeon will be able to advise about any precautions that should be taken to safeguard the health of the existing herd and of the purchased cattle.

To re-order or to download and print off further copies of the checklist please visit dairy.ahdb.org.uk/cattle-purchasing-checklist

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