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## Biosecurity Advice and Cattle Purchasing Checklist

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**DairyCo**

# Introduction

Biosecurity is a word that became firmly embedded in the agricultural vocabulary of our nation during the outbreak of foot and mouth disease that swept across the country during 2001. In most cases its meaning was interpreted as referring to the precautions that should be taken to prevent the introduction of foot and mouth 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, but not the only, 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 your herd is fully appreciated and a veterinary health plan is in place and not just for farm assurance purposes.

## Which diseases should be considered when purchasing cattle for inclusion in an established herd?

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 terms of animal welfare and 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:**

Bovine tuberculosis 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 tuberculosis. 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 tuberculosis relies on mandatory testing at intervals directed by the State Veterinary Service. All testing instructions should be complied with.

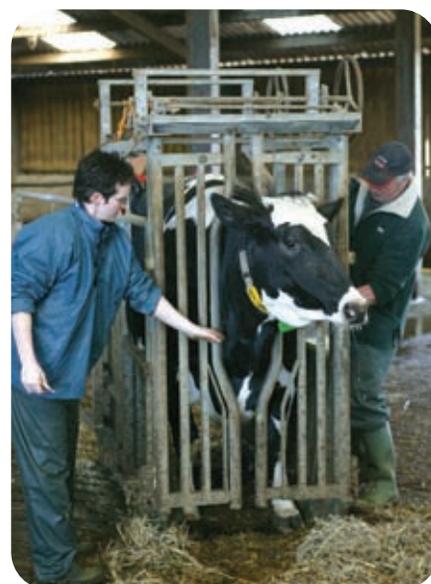
In order to reduce the risk of introducing bovine tuberculosis into your herd when purchasing cattle you should:

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 (and if so, when) tuberculosis 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 tuberculosis test on any purchased animals and keep the purchased animals in isolation until the results of the test are known.

- **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 accredited or monitored free 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.



- **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. All persistently infected animals will die of mucosal disease, a chronic, irreversible scouring, usually by two years of age.

In order to reduce the risk of introducing BVD into your herd when purchasing animals you should:

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 both BVD antibodies and antigen are known. (Vaccinated animals should be tested to ensure an antigen 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 which 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.)

- **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 a risk, particularly at times of stress.



To reduce the risk of introducing IBR into your herd when purchasing animals you should:

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:**

There are several distinct strains of bluetongue virus which 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 and BTV6 has also been recorded in northern Europe.

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 you should:

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.

- **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 you should:

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.

- **Campylobacter foetus venerealis:**

*C. foetus venerealis* 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 which 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 *C. foetus venerealis* can cause infertility and abortions.

In order to safeguard a herd against the introduction of *C. foetus venerealis* 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 he should be treated with prophylactic antibiotics and have his prepuce washed daily for three consecutive days using a specially prepared antibiotic solution.

- **Neospora caninum:**

*Neospora caninum* is a protozoal organism that can infect cattle (and other species) and cause abortions. Its pathogenesis (how it spreads) is not fully understood although carrier animals, dogs and possibly foxes, are involved and vertical transmission from cow to calf is a feature.

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.

- **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, however, 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.

- **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 at the time of their first calving after being imported to ensure freedom from disease.

- **Parasites:**

It is advised that all purchased animals are treated to ensure, as far as is possible, freedom from gastrointestinal worms, lungworm, liver fluke, lice and mites before they are introduced into an established 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. Whilst in quarantine they should be observed carefully to ensure that they do not develop any signs of infectious disease. During the time that 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 whilst 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'.
- **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 (PI). 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 that 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 whilst 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 which 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 free 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 which 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% 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.

- **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 the 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.
- **Antigen 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 determine, as far as is possible, the status not only of the animals that you are buying but of their herd of origin as well. This knowledge, in conjunction with a knowledge of the health status of your own 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 determined. 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 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 which is born infected and which remains infected for its entire life.

**Prophylactic** – preventative

**Sero-negative** – an animal which does not have circulating antibodies to a specific organism indicating that it has never been exposed to nor infected with that organism.

**Sero-positive** – an animal which has produced antibodies which continue to circulate in its blood indicating previous exposure to or infection with a specific organism.

**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 an animal to man.

# Disease risk reduction checklist for use when purchasing cattle

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

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

It is recommended that this list is used as an aide-mémoire when discussing your proposed cattle purchase with your veterinary surgeon, who will be able to advise about any precautions that should be taken to safeguard the health of your herd and of the purchased cattle.



# Cattle Purchasing Disease Checklist

Date:.....No. of animals:.....

Name & address of farm where cattle are to be purchased from:

.....  
.....  
.....Tel:.....

Vendor's vet name & address:

.....  
.....  
.....Tel:.....

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## Bovine Tuberculosis – A notifiable bacterial disease of cattle which can also affect people.

- Have the cattle to be purchased been tested recently?  Yes  No
- Has the source herd had a clear herd test recently?  Yes  No
- What is the testing frequency imposed on the source herd?  Annual  Biannual  4 Yearly
- Does the source herd have a history of bovine tuberculosis?  Yes  No

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## Johne's Disease – An invariably fatal disease of cattle with insidious onset after a long incubation period.

- Does the source herd have Johne's disease free accreditation?  Yes  No
- Has the source herd had any confirmed or suspect cases?  Yes  No
- Does the source herd vaccinate?  Yes  No

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## BVD – A viral disease of cattle that causes a multitude of clinical signs including infertility, abortions and the production of deformed or persistently infected calves. Persistently infected calves invariably die.

- What is your herd's status?  Clear  Vaccinated  Infected
- What is the source herd's status?  Clear  Vaccinated  Infected
- Are the animals to be purchased persistently infected?  Yes  No
- Are the animals to be purchased pregnant?  Yes  No

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## Leptospirosis – A bacterial disease of cattle causing reproductive failure and milk drop. It can affect people.

- What is your herd's status?  Clear  Vaccinated  Infected
- What is the source herd's status?  Clear  Vaccinated  Infected

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## IBR – A viral disease of cattle causing respiratory disease, reproductive failure and milk drop. A carrier status often exists following infection and apparent recovery.

- What is the status of your herd?  Clear  Vaccinated  Infected
- Are the animals to be purchased antibody positive?  Yes  No
- If antibody positive, have the animals to be purchased ever been vaccinated?  Yes  No
- If so which vaccine was used?  Conventional  Marker

## Bluetongue

- Are the cattle to be purchased being sourced from a BTV endemic area?  Yes  No
- If so, which are the relevant strains of BTV? .....
- Have the cattle to be purchased been vaccinated against BTV?  Yes  No
- If so, with which vaccine and when? .....
- Have the cattle to be purchased been tested for the bluetongue virus (PCR test) or for antibodies to the virus (ELISA test)?  Yes  No
- If so, when and what were the results? .....
- Have the cattle to be purchased been treated with a pour-on insecticide which is active against midges?  Yes  No
- If so, when and with what? .....

## Campylobacter foetus venerealis – A sexually transmitted bacterial disease of cattle that can cause infertility and abortions.

- Do you use any natural service in your herd?  Yes  No
- Are the animals to be purchased virgins?  Yes  No
- If the animals to be purchased are not virgins and they are female, were they run with a bull?  Yes  No

## Salmonella – A reportable disease with human health implications.

- Is there any evidence of salmonellosis in the source herd?  Yes  No
- If so, what? .....

## Brucellosis – A disease that can affect people and which causes cattle to abort.

- Have the cattle to be purchased been imported from outside GB?  Yes  No

## Neospora caninum – A protozoal parasite that can cause cattle to abort.

- Have the animals to be purchased been tested?  Yes  No

## Parasites – Purchased cattle may harbour a variety of parasites including gut worms, lung worms, liver fluke, lice and mites.

- Has the parasite status of the animals to be purchased been assessed?  Yes  No
- Have the animals to be purchased been vaccinated against lungworm?  Yes  No
- Has any treatment been given to eliminate parasites?  Yes  No

## Digital Dermatitis – The most common infectious cause of lameness currently affecting particularly dairy cattle in the UK.

- Is digital dermatitis present in your herd?  Yes  No
- Is digital dermatitis present in the source herd?  Yes  No
- Have the animals to be purchased had their feet lifted, cleaned, inspected and treated?  Yes  No

## Mastitis – A common multifactorial disease which can cause significant economic loss.

- Are the animals to be purchased cows or maiden heifers?  Cows  Heifers
- Have the source herd's cell count and mastitis records been seen?  Yes  No
- If cows, have the cell count and mastitis records of the animal to be purchased been seen?  Yes  No

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