

Biosecurity in Dairy and Beef Cattle

Johne's disease, Bovine Virus Diarrhoea Virus (BVDV), Salmonellosis, Bovine Tuberculosis, Leptospirosis, and Infectious Bovine Rhinotracheitis (IBR) are just some examples of infectious diseases that can be introduced onto your cattle farm and severely affect its financial viability. Preventing them entering your farm and, once they've entered, minimising their spread can save significant amounts of money.

What is biosecurity?

Biosecurity - reduces/prevents the introduction of new diseases onto a farm from outside sources

Biocontainment - reduces/prevents the movement of infectious diseases once they are on the farm

Biosecurity is your first line defence which prevents new diseases entering your farm; biocontainment measures aim to limit the spread of disease within your herd and hence financial losses following introduction of disease onto your farm once biosecurity has been breached.



Fig 1: The animal on the left was a bargain at a dispersal sale. As a persistently infected animal it has now introduced BVD into your previously closed herd.

Disease spread

Infectious diseases can be introduced onto your farm by:

- The introduction of diseased animals
- The introduction of animals incubating disease
- Introduction of apparently healthy animals that have recovered from disease but are now carriers

- Vehicles, equipment, clothing and footwear of people (veterinarians, contractors, other farmers, salesmen, service personnel) who move between herds
- Feedstuffs, especially high risk feedstuff which could be contaminated with faeces
- Contaminated water (surface water, streams and rivers etc.);
- Manure handling especially by outside contractors and aerosolized manure and dust
- Other species such dogs, cats, wildlife, rodents, birds and insects.



Fig 2: These cows looked good when purchased one year ago - now the cow in the foreground shows signs of Johne's disease



Fig 3: The same cow pictured three months later - the potential for disease spread has been and remains enormous

Biosecurity principles

Biosecurity measures aim to reduce/prevent the introduction of new diseases onto a farm from outside sources. Biosecurity control has four major components: 1. Selection of purchased animals (if not closed herd) 2. Isolation following purchase, 3. Movement control 4. Sanitation.

The Key Principles of Biosecurity

Select all necessary purchased animals from known sources and health status equal to or higher than your own to reduce the risk of infection.

Strict isolation prevents contact between animals after arrival on farm and reduces the risk of spread of infectious agents.

Movement control includes all vehicle, animals, and people traffic that could introduce infection onto your farm.

Sanitation addresses the disinfection of materials, people and equipment entering the farm and the cleanliness of the people and equipment on the farm.



Fig 4: One critical area of biocontainments is the prevention (or minimizing) of cross-contamination of an animals infected body fluids (faeces, urine, saliva, respiratory secretions, discharges from abortion/calving etc.) to other animals, feed and equipment. Is this a suitable water supply? There was no mains/piped water supply to this field.

Selection of purchased animals

Know the health history of the herds from which cattle are purchased.

Know the health status of animals brought onto your farm.

Never bring in animals without knowing their vaccination history

Limit purchases to maiden heifers and bulls



Fig 5: Contaminated surface water and a midden - good biocontainment



Fig 6: A suitable environment for cattle?

Isolation

Quarantine all new arrivals for at least 30 days

Cattle must not share community pastures/common grazings

Cattle must not share fence lines with neighbour's cattle.

Do not use hire bulls from other farms

Movement control

Record all visitors to your farm both human and domestic animal

Sanitation

Attempt to prevent manure contamination of feed and equipment used orally.

Use different equipment to feed and to clean pens or completely clean between use.

Routinely clean and disinfect feeding equipment and cattle handling equipment.

Never step in the feed bunk.

Transport animals in clean vehicles.

Loading area is located at the perimeter of the farm.

SPECIFIC DISEASE RECOMMENDATIONS

Bluetongue

Current advice from DEFRA states that BTv8 vaccination in England and Wales is the only effective way for individual farmers to protect the welfare of their animals and their own livelihood against Bluetongue. The nature of this disease is such that keepers cannot rely on their neighbours' vaccination: midges can be carried by winds and by human activity. The only sure way to protect against Bluetongue is for farmers to vaccinate their own animals.

Johnes's disease (Paratuberculosis)

Johnes's disease (Paratuberculosis) is a chronic enteritis of adult cattle and sheep caused by *Mycobacterium avium* subspecies *paratuberculosis* (MAP). The main signs in cattle are progressive weight loss and chronic diarrhoea.

Control

- Blood testing and/or faecal examination may be done every 6-12 months with slaughter of positive cases. Two consecutive herd negatives may indicate eradication.
- Rapid culling of diseased animals.
- Minimise faecal contamination of food, water and pasture e.g. by raising feed and water troughs, strip grazing, use of mains/piped water rather than surface/pond water, avoid spreading yard manure on pasture, maintain good hygiene in buildings/yards and calving boxes in particular.
- Calve animals with a history of diarrhoea in isolated accommodation
- Separate newborn calves from dams at birth and rear by bucket with artificial colostrum/milk (only possible for dairy calves).
- In affected dairy herds, do not feed pooled colostrum
- Do not feed waste milk to calves

- Do not raise calves from known infected dams as breeding replacements.
- Re-stock only from accredited herds, especially bulls.
- Vaccination has been used as an aid in the control of Johnes in many countries and can be imported into the UK under license.

Bovine virus diarrhoea (BVD)

Many herds have BVDV present within their cattle where disease/losses are partly, but poorly controlled by persistently infected (PI) calves acting as "natural vaccinators" of the herd. When most adult animals in the herd are immune disease losses are not so obvious to the farmer. However, this situation is not optimum as the disease will still be present and there are ongoing losses which can be catastrophic if naïve breeding females are introduced into the herd.

BVD can be controlled by initial vaccination which comprises two doses 3-4 weeks apart before first service followed by booster vaccination at 12 months' intervals. If all breeding females are vaccinated then this will control disease by preventing BVD infection of the developing fetus during pregnancy and production of PI calves.

BVD eradication is possible following whole herd blood testing and elimination of all PI carrier animals. If farmers go for eradication then strict herd biosecurity measures must be maintained to prevent re-introduction of virus infection as the herd will soon become naïve and fully susceptible to infection.



Fig 7: Double perimeter fencing

Salmonellosis

Management / biosecurity measures that will reduce the risk of Salmonella infections in cattle include:

- Avoid introducing potentially infected animals by maintaining a closed herd.
- Quarantine all introduced stock for at least four weeks.
- Source new stock from other farms with high health status and not markets.
- Avoid shared bulls and communal grazing areas.
- Isolate sick animals in dedicated isolation boxes and not calving boxes.
- Clean and disinfect buildings between occupancies. Provide good drainage and waste removal.
- Maintain good fences to prevent straying of neighbouring stock.
- Protect all feed stores from vermin including birds.
- Only spread slurry on arable land wherever possible. Leave all grazing land at least three weeks after spreading slurry.
- Insist visitors have clean boots and disinfect before entering and leaving the farm premises.

Consider herd vaccination where the problem persists despite the control measures listed above.

Tuberculosis

- Avoid introducing potentially infected animals by maintaining a closed herd.
- Pre-movement testing
- Double perimeter fencing

Infectious bovine rhinotracheitis and other viral respiratory diseases

- Avoid introducing potentially infected animals by maintaining a closed herd.
- Vaccinate all purchased cattle upon arrival then isolate for four weeks
- Double perimeter fencing

Leptospirosis and other potential causes of abortion

- Avoid introducing potentially infected animals by maintaining a closed herd.
- Leptospirosis can be controlled by initial vaccination which comprises two doses 3-4 weeks apart before first service followed by booster vaccination at 12 months' intervals.

- Vaccinate all purchased cattle upon arrival then isolate for four weeks
- Fence off all surface water/streams and rivers and use mains water supply wherever possible.
- Isolate aborted cattle
- Dispose of all products of abortion correctly (bury, burn or collected)

Control measures available for cattle farmers

Closed herd with secure perimeter

Prevents introduction of all diseases with the exception of exotic diseases such as Bluetongue and Foot and Mouth disease (FMD) with arthropod and airborne vectors, respectively.

All replacements purchased from herd of known disease status

Prevents introduction of specified diseases e.g. tuberculosis. Such control relies upon a very robust testing and monitoring programme. Very few such herds exist for many diseases e.g. Johne's disease.

Biocontainment measures reduce/prevent the movement of infectious diseases on the farm.

Vaccination of all purchased stock can be used to control

Bluetongue,

FMD (Government policy decision),

Johne's disease,

BVD,

IBR and other respiratory viruses,

Leptospirosis,

Salmonellosis.

Conclusions

Maintain a closed herd wherever possible using artificial insemination to introduce new genetics where necessary. Oestrus synchronisation programmes can be very successful in groups of beef cattle especially heifers.

Many diseases can be effectively controlled by vaccination.

Isolate all purchased cattle for at least one month following arrival on the farm.

Maintain perimeter fences.

Finally, there is no such thing as a bargain - if the deal at the market or dispersal sale looks to good to be true then it is!

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