

IBR: A technical guide for veterinary practitioners advising breeders of dairy bull calves with potential for use as AI Sires

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IBR ERADICATION PROGRAMME

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Introduction

The delivery of high genetic merit bulls for breeding programmes is essential if Irish breeders are to achieve sustained genetic gain in their herds. In addition to high genetic merit, high health status is also required to realise this genetic potential.

Background

Semen collection centres in Ireland operate to European standards (Commission Delegated Regulation (EU) 2020/686 of 17th December 2019 supplementing Regulation (EU) 2016/429 of the European Parliament and of the Council as regards the approval of germinal product establishments and the traceability and animal health requirements for movements within the Union of germinal products of certain kept terrestrial animals) to ensure that semen produced meets requirements for trade in Ireland and within the European Union. These require that bulls entering semen collection centres are free from disease-causing agents that may be spread through semen, including infectious bovine rhinotracheitis (IBR), bovine viral diarrhoea (BVD), *Campylobacter fetus* subspecies *venerealis* and *Tritrichomonas foetus*.

The screening process begins with testing of bulls before they enter the quarantine facility of the collection centre. In addition the herd or herds in which the bull has lived must all have been classified as free of TB, Brucellosis and enzootic bovine leucosis (EBL) during the periods for which the bull was resident.

This document focuses on IBR for two reasons:

- **IBR is the disease which most frequently results in bull calves being rejected for entry to collection centres.**
- **IBR is the disease which currently presents the greatest threat to collection centres.**

Key Points

Only calves that are free from IBR antibodies are allowed to enter collection centres. The best practice is to ensure that in the first 72 hours of life the calf only receives colostrum from a known IBR negative cow.

If your calf only receives colostrum from an IBR-antibody negative cow, it is most unlikely that the calf will become a seronegative latent carrier (SNLC).

Vaccinating herds that may put bulls into collection centres in the future should only use 'Marker' vaccines (only 'Marker' vaccines are licenced for use in the Republic of Ireland). Where antibody negative colostrum is not available, the use of 'Marker' vaccines will allow you to select colostrum from vaccinated, uninfected cows. **Do not vaccinate potential individual AI sires.**

Veterinary Technical Box

There is evidence that approximately 70% of Irish herds have had some level of exposure to IBR virus. Following infection animals become lifelong carriers of the virus. These carriers almost always test positive for antibodies to IBR virus. To be eligible to enter a semen collection centre, bulls must test negative on a blood sample for antibodies to IBR virus.

A negative result on this test makes it very unlikely that a bull is a carrier of IBR virus. However, it is recognised that a small proportion of carrier animals may test negative for antibodies. These are called sero-negative latent carriers (SNLC). These are usually created when an animal becomes infected early in life while it still has maternally derived antibodies (MDA) from colostrum.

See Q12 in the 'IBR: FAQ' leaflet for further information on vaccine types [click here](#).

Objective

This document provides advice to breeders on the health management of young dairy bulls of potential interest to AI companies, aiming to maximise the likelihood that calves are free from infection with IBR. AI companies will preferentially purchase calves that are antibody test negative at (or before) 42 days of age.

Veterinary Technical Box

A negative result at 42 days of age indicates the calf has not been infected with IBR (unless this occurred shortly before sampling) and also that it has ingested little or no IBR-specific colostral antibodies and is therefore also unlikely to be an SNLC.

Many breeders may be aware that a calf is a potential AI sire before it is born, giving the greatest opportunity to manage the calf and its dam appropriately (both before and after birth).

What to do on farm

- Ensure that the service date and sire of the pregnancy is recorded in the ICBF database at the end of the breeding season.
- Register calves online at www.agfood.ie or through your farm management App as soon as possible after birth.

Where you are made aware of a cow or heifer that may be carrying a potential AI sire, the following flow charts provide guidance on the investigative and management steps to follow, depending on whether or not you have a vaccination programme in place and also the results of previous testing.

NOTE: Always discuss your vaccination programme with your veterinary practitioner.

Veterinary Technical Box

The use of live intranasal vaccine has the potential to accidentally infect potential AI sires, preventing their entry to collection centres.

Vaccinating Herds

Figure 1 provides a step by step guide on how to investigate the IBR status of your herd, beginning with bulk tank milk (BTM) testing and how to protect potential AI sires from IBR. See the accompanying footnotes for further explanation.

Key points

- All vaccinations should be carried out as part of a tailored programme in consultation with your veterinary practitioner.
- Where potential AI bull mothers are identified before calving they should be screened for the presence of gE antibodies to IBR.
- Where a bull mother is positive for gE antibody an alternative gE negative colostrum source within the herd should be identified for her calf.

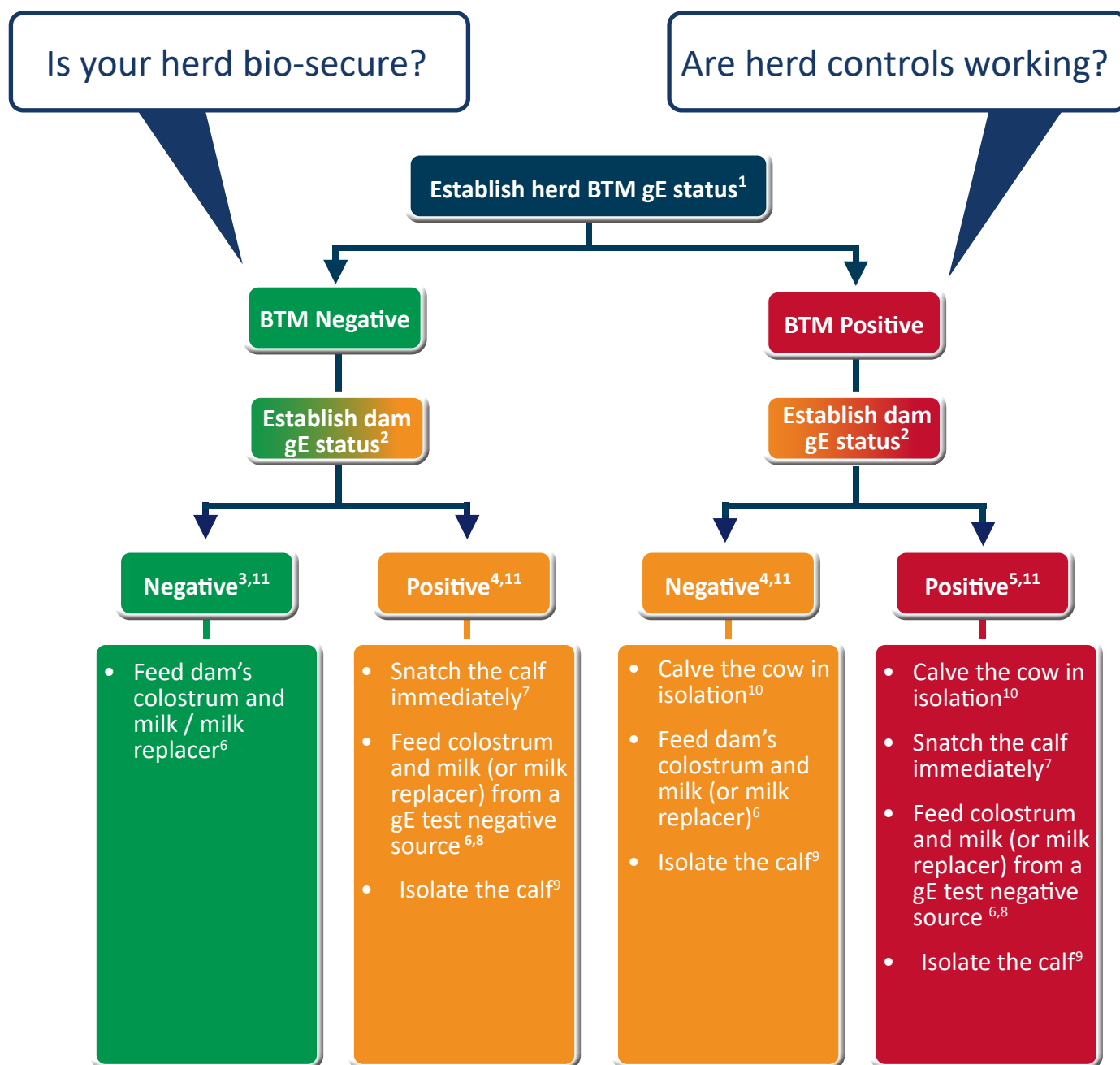


Figure 1. VACCINATING HERD - steps to protect potential AI sires from IBR.

For explanatory notes 1–11, see below

Explanatory Notes

1. Use bulk milk tank (BMT) testing to investigate the IBR status of your herd using a test for gE antibodies. A positive BTM result confirms infection in the herd. A negative BTM result is consistent with a herd where the animals contributing to the tank are free from infection or have a low prevalence of infection on the day of sampling. For further information on herd testing strategies see [**IBR: An information leaflet for Irish farmers, advisors and vets.**](#)
2. A negative individual animal gE result on the day of testing does not necessarily mean the animal will still be negative at calving; sampling should be done as close to calving as is practical. In vaccinating herds the gE test allows individual vaccinated and infected animals to be distinguished (animals that have been vaccinated but not infected will be gE-negative, although they will still be positive on the gB test).
3. In a vaccinating herd with a negative gE BTM result, a calf from a cow with a negative gE has the lowest risk of exposure.
4. Calves from a gE negative cow in a BTM-positive herd or from a gE positive cow in a BTM-negative herd have a similar, intermediate level of risk of being exposed. In the former, other animals in the herd are the main potential source of infection (although the risk is reduced by the use of vaccine); in the latter the dam is the main potential source (again reduced by the use of vaccine). Each of these two situations therefore requires different management measures, as indicated.
5. A calf from a **cow** with a **positive gE result** from a herd with a **positive gE BTM** result has a higher risk of exposure to the virus, as both its own dam and other animals in the herd are potential sources of infection. There is a risk that an infected dam may shed the virus during calving, infecting the calf and causing an antibody response that will result in the calf failing its entry test for a semen collection centre or creating a SNLC status which may not be detectable. The use of vaccine should markedly reduce the risk of the dam (and other animals) shedding virus and infecting her calf.
6. Feed the calf gE negative colostrum/milk for the first 2–3 days, and then the calf can either be kept on gE negative milk or switched to a high quality milk replacer. Note that milk replacer may contain antibodies to IBR virus but these should not be absorbed from the gut after the calf is 2–3 days old.
7. If the dam has tested gE positive remove the calf immediately (eg within 15 minutes) after birth. Contact between cow and calf should be minimized to prevent the calf from suckling the cow and limit the opportunity for the calf to be infected by the dam. House the calf in a clean isolation area.
8. A test positive dam will have antibodies to IBR in her colostrum. If the calf is fed this colostrum, it will have detectable Maternally Derived Antibodies (MDA) in its blood for a number of months. The calf cannot pass the entry test for the semen collection centre until these have disappeared. Note that this is the case even where the calf is not gE-positive- i.e. only has antibodies to the vaccine virus. Nonetheless it is better to preferentially feed gE-negative (rather than gE-positive) colostrum (first milk collected within 6 hours of calving). Blood test heifers or cows that will calve before the dam of the potential AI sire to identify gE test negative animals that can be used as colostrum donors. Note that younger animals are more likely to test negative.
9. House the calf in a clean isolation area. Two or more calves of similar status can be kept together.
10. To reduce the risk of calves being infected at birth, calvings should take place in individual calving boxes (no contact with other animals) that are clean, dry and have been disinfected.
11. [**Click here**](#) for more information on biocontainment and isolation, and [**click here**](#) for management suggestions for calving and calf rearing.

Non-vaccinating herds

Figure 2 provides a step by step guide on how to investigate the IBR status of a non-vaccinating herd, beginning with bulk milk testing (BTM) and how to protect potential AI sires from IBR.

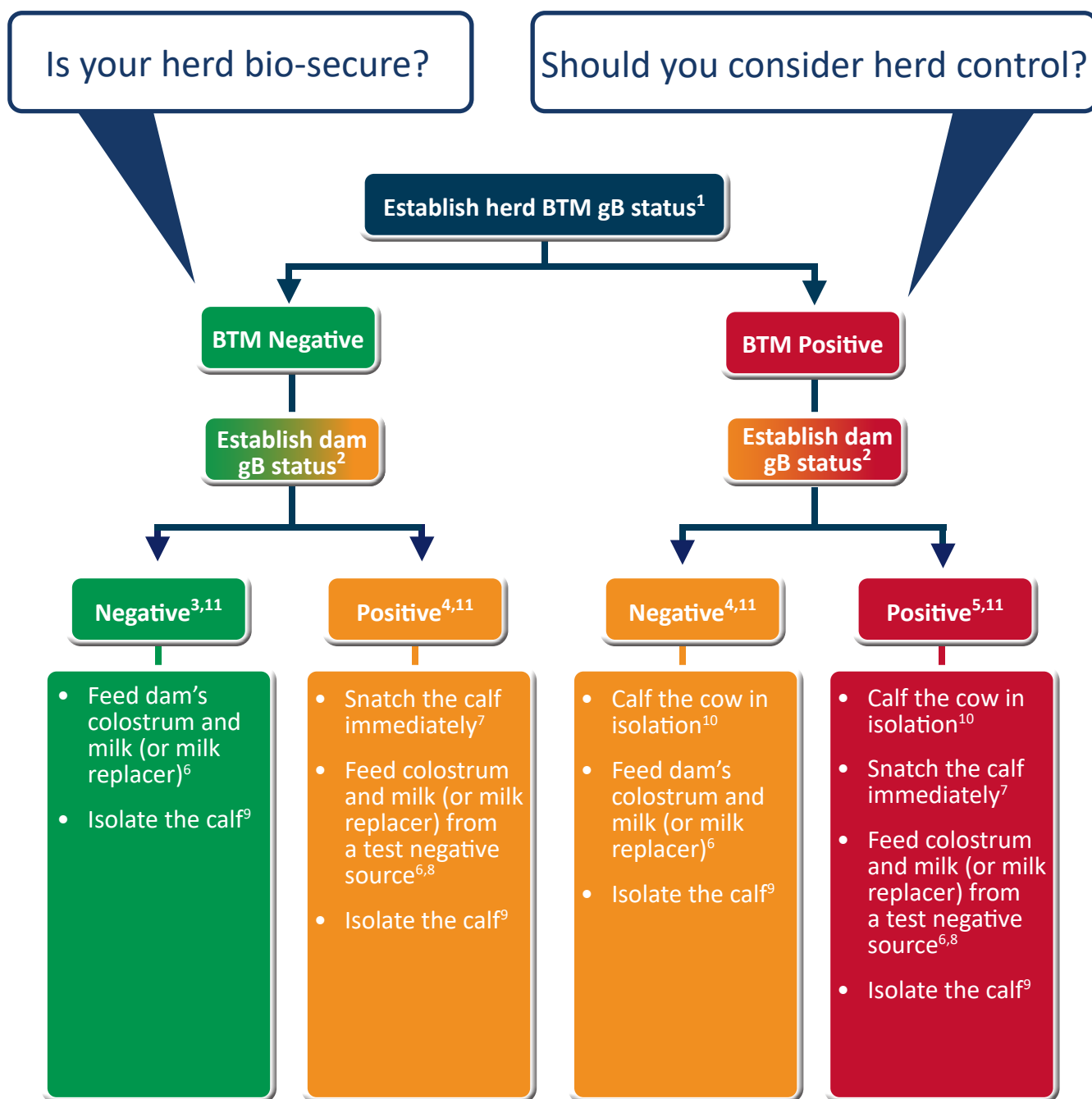


Figure 2. NON-VACCINATING HERD - steps to protect potential AI sires from IBR

For explanatory notes 1–11, see below

Explanatory Notes

1. Use bulk tank milk sampling (BTM) to investigate the IBR status of your herd using a gB (or whole virus) antibody test. A positive result confirms infection. A negative BTM result is consistent with a herd where the animals contributing to the tank are free from infection or have a low prevalence of infection on the day of sampling. For further information on herd testing strategies see [**IBR: An information leaflet for Irish farmers, advisors and vets**](#).
2. In non-vaccinating herds the gB (or whole virus) antibody test should be used for individual animal testing. A negative result on the day of testing does not necessarily mean the animal will still be negative at calving; sampling should be done as close to calving as is practical.
3. A calf from a cow with a negative gB result in a non-vaccinating herd with a negative BTM result has the lowest risk of exposure to the virus.
4. Calves from a negative cow in a BTM-positive herd or from a positive cow in a BTM-negative herd have a similar, intermediate level of risk of being exposed. In the former, other animals in the herd are the main potential source of infection; in the latter the dam is the main potential source. Each of these two situations therefore requires different management measures, as indicated.
5. A calf from a **positive** (carrier) **cow** in a **positive** herd has the greatest risk of being exposed, with both its own dam and other animals in the herd being potential sources of infection. There is a risk that an infected dam may shed the virus during calving, infecting the calf causing an antibody response that will result in the calf failing its entry test for a collection centre.
6. Note that milk replacer may contain antibodies to IBR virus but these should not be absorbed from the gut after the calf is 2–3 days old.
7. If the dam has tested positive the calf should be removed immediately after birth (within 15 minutes) and housed in a clean isolation pen box (with no physical contact with other animals). Contact between cow and calf should be minimized to prevent the calf from suckling and limit the opportunity for the calf to be infected by the dam. House the calf in a clean isolation area.
8. A test positive dam will have antibodies to IBR in her colostrum (first milk collected within 6 hours of calving). If the calf is fed this colostrum, it will have detectable maternally derived antibodies (MDA) in its blood for a number of months. The calf cannot pass the entry test for the collection centre until these have disappeared. In the meantime it remains at risk of becoming infected. Blood test heifers or cows that will calve before the dam of the potential AI sire to identify test negative animals that can be used as colostrum donors. Note that younger animals are more likely to test negative.
9. House the calf in a clean isolation area. Two or more calves of similar IBR exposure status can be kept together.
10. To reduce the risk of calves being infected at birth, calvings should take place in individual calving boxes (having no contact with other animals) that are clean, dry and have been disinfected.
11. [**Click here**](#) for more information on biocontainment and isolation, and [**click here**](#) for management suggestions for calving and calf rearing.

NOTE: If feeding colostrum from other cows to avoid IBR, you must weigh up the risk that a calf may be exposed to other diseases such as Johne's disease (which could be transmitted through MAP infected colostrum). It is recommended that farmers maintain records of any incidences where an alternate colostrum source was used.

Should I vaccinate for IBR?

It is recommended that all herds address IBR control at herd level with a view to achieving freedom. This may require a vaccination programme. Discuss this with your own veterinary practitioner.

If you are vaccinating, **do not vaccinate potential AI sires**. Vaccinated animals will have IBR antibodies and all vaccinated bull calves will fail the entry test. Care should also be taken to avoid accidental exposure of these calves to vaccinal virus e.g. through contaminated vaccinating equipment. Only marker vaccines are licensed for use in the Republic of Ireland, while both marker and conventional non-marker vaccines are licensed in Northern Ireland. These non-marker vaccines should not be used in the Republic of Ireland. Be aware that combination vaccines purchased in Northern Ireland may include non-marker IBR vaccines. These are illegal for use in the Republic of Ireland and do not allow differentiation of animals which have been vaccinated from those that have been infected naturally.

**IF YOU ARE VACCINATING,
DO NOT VACCINATE
POTENTIAL AI SIRE CALVES**

Generally calves born in vaccinated herds are at lower risk of becoming infected due to the lower level of virus circulation in these herds.

See Q12 in the 'IBR: FAQ' leaflet for further information on vaccines type [click here](#).

Checklist

Before drying off:

- ☐ Carry out a BTM test to establish herd IBR status.
- ☐ Identify potential calvings of interest.

Before calving:

- ☐ Determine the IBR status of the dam.
- ☐ Identify another source of negative colostrum if required. (gE negative in a vaccinating herd, gB negative in non-vaccinating herd).
- ☐ Prepare the isolation area.

At calving:

- ☐ Snatch the calf if necessary.
- ☐ Ensure the calf receives colostrum with gB negative (gE negative in vaccinating herd) IBR antibody status.
- ☐ Isolate the calf or calves of interest.
- ☐ Manage these calves separately while their potential is being evaluated.

How are potential AI sires identified?

Where breeding data is available prior to calving

In this situation, a contract to genotype the calf may be issued by the AI Company that is interested in the individual calf before the cow calves. Registering all births promptly on www.agfood.ie or your farm management App will allow an early decision to be taken on whether or not to genotype the calf. A decision to genotype the calf will result in a hair sampling kit being issued. The calf must be kept in isolation and managed accordingly while the genotyping is being carried out. Early return of this kit will allow prompt decisions to be made in relation to your calf.

Where breeding data is only available after calving

This can occur where breeding data for a calf is incomplete until it is registered at which point calves may then be identified as potential AI sires. By this time the calf has been born and colostrum will have already been fed so there will have been a missed opportunity to carry out many of the preventive measures detailed above. However, once identified it is recommended to move the bull calf to a clean isolated area, to use separate feeding equipment and to not feed waste milk.

Recommended reading

- [Click here](#) for access to the AHI information leaflets on IBR.
- [Click here](#) for access to the AHI information leaflets on biosecurity.
- [Click here](#) for access to the AHI information leaflets on calf management.
- SI No 311 of 2010, [European Communities (Welfare of farmed animals) Regulations 2010], pages 15–17 details the animal welfare requirements for young calves which is available online on [click here](#).

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