IBR: impacts and control

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Summary

- Infectious bovine rhinotracheitis (IBR) is a highly infectious respiratory disease of cattle.
- Infected animals typically recover but become carriers of the virus. Under stress, they may start shedding virus and infecting other animals.
- Approximately 75% of Irish herds contain animals that have been exposed to IBR and are carriers.
- Irish suckler herds involved in the BETTER Farm Beef Programme that participated in the Pilot IBR Programme had 30 animals tested for IBR per herd (snapshot test).
- Results showed that over 50% of the tested herds had a negative snapshot test, indicating the absence or low number of IBR-positive animals in the herd.
- Snapshot testing can be used to get an initial indication of the herd's IBR status, providing information to better manage risk, improve biosecurity and inform decisions on vaccination at herd level.

Introduction

Infectious bovine rhinotracheitis (IBR) is a highly infectious disease caused by a virus called bovine herpes virus-1 (BoHV-1). In Ireland, IBR is mostly involved in respiratory infections, being one of the viral agents involved in the Bovine Respiratory Disease (BRD) complex. Infection with this virus is widespread, with an estimated 75-80% of both beef and dairy herds containing animals that have been infected. In this article, we will explore the impact of IBR and discuss effective control measures that Irish farmers can implement to protect their herds and the wider industry.

Clinical signs of IBR

The severity of the clinical signs can vary and is influenced by a number of factors such as the husbandry system, secondary bacterial infections, immunity status, degree of stress and the age of the affected animal.

Clinical signs typically appear after housing, transport, sale, calving or other stressful events. Affected animals may be dull, off their feed and develop a high temperature (107-108°F/41.7-42.5°C). They typically have a watery discharge from the nose and eyes and may present with red nose and eyes. In severe cases, ulcers develop on the muzzle and lining of the nasal passages, which can form scabs as they heal. The windpipe will also be affected, leading to coughing and noisy breathing if severe enough.

While most affected cattle will recover, a low percentage will die. Although infection is relatively uncommon in very young calves, infection may spread beyond the airways to

the gut (producing scour), brain (producing nervous signs) and other internal organs, and as a result death rates in this age group are often higher than in older cattle. Infection with BoHV-1 has also been associated with abortions.

Latently infected carriers of IBR

Animals that survive infection recover, produce antibodies and also develop a 'latent' or hidden infection, becoming lifelong carriers (Figure 1). This latent infection typically becomes established in the nerve cells within the animal's brain. During this latent period the carrier is not shedding virus. However, at times of stress the virus may be reactivated and can begin to multiply and be re-excreted, generally from the nose and eyes. This leads to new infections in other susceptible cattle, which in turn will also become latent carriers (Figures 1 and 2). These latently infected carriers play a central role in maintaining IBR in infected herds, where they act as a reservoir of infection, and in spreading infection between herds.

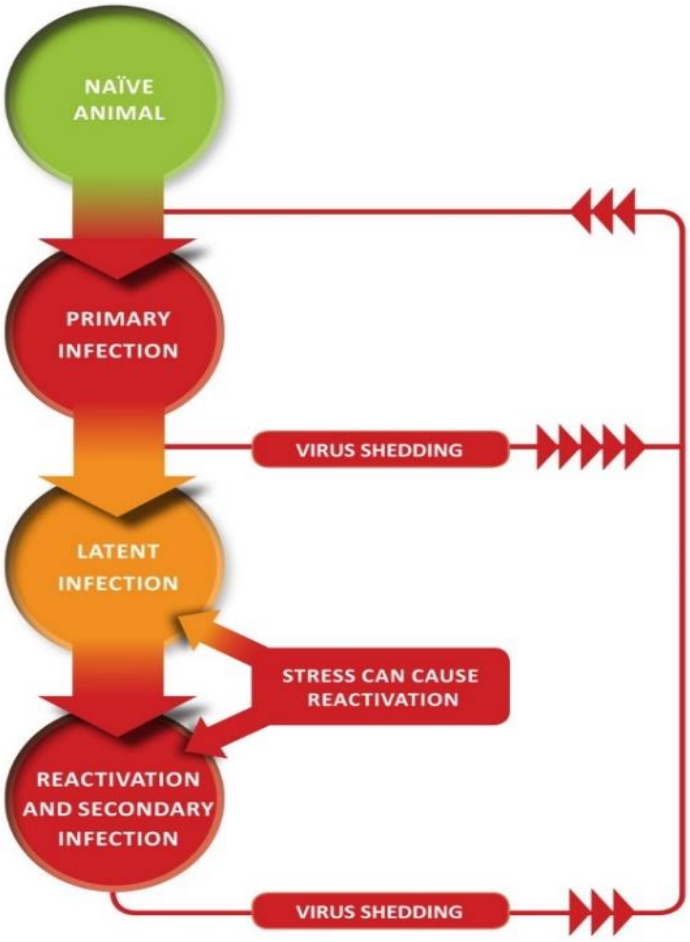

Figure 1. Phases of infection of IBR in an individual animal.

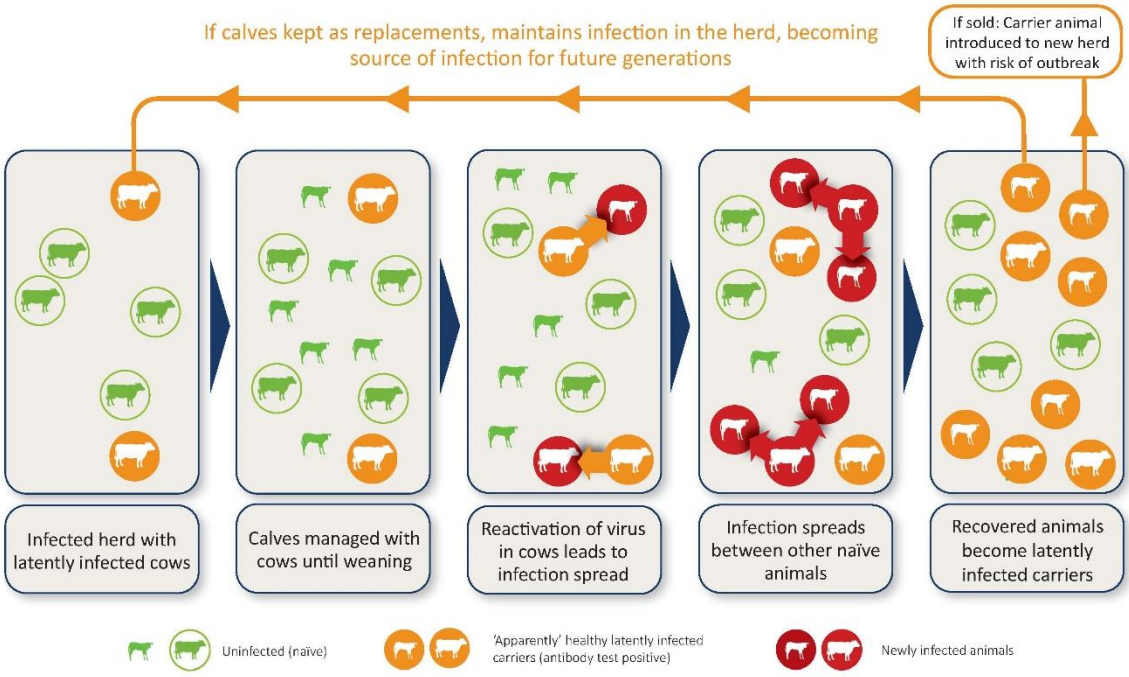

Figure 2. Spread of IBR in a non-vaccinating suckler herd following reactivation and shedding of virus from carrier to naïve (susceptible) animals

The virus is mainly spread directly by close contact between animals. The nasal discharge from infected animals can contain very high levels of virus and, as a result, infection can spread rapidly through a herd when susceptible cattle come in contact with infectious cattle or items contaminated by them, such as feeders and drinkers. The virus can also be shed from the reproductive tract, including via semen, resulting in venereal transmission. Airborne spread may also occur over distances of up to 5 metres. Indirect transmission within or between herds can also occur through movement or sharing of contaminated facilities, equipment or personnel.

Impact of IBR

IBR can have a significant impact on cattle health and welfare and therefore, a negative impact on animal productivity. So typically, diseased animals may have poor weight gain, reduced milk yield, abortion etc. This reduction in animal productivity is then reflected in increased on-farm costs, increased use of antibiotics (to treat secondary bacterial infections) and reduced farm profitability.

IBR-infected animals (and any associated products such as semen or embryos) cannot be traded to many regions and countries in the EU that are officially recognised as free of IBR (i.e. Denmark, Germany, Austria, Norway, Finland, Sweden, Czech Republic and regions of Italy) or have an approved IBR control programme (i.e. Belgium, France, Luxembourg, regions of Italy and regions of Slovakia). Of particular concern is the possible approval by the European Commission of the IBR eradication programme currently underway in The Netherlands, and the consequences it will have for calf exports. In addition, many 'third' countries have IBR-specific requirements for live exports.

Animals that have antibodies to IBR (even if as a result of vaccination) are legally prohibited from entering semen collection centres. These herds are recommended to have

eradication programmes in place (if not already IBR-free). Potential AI sires should not be included in vaccination programmes and vaccinating herds require careful planning to prevent accidental exposure of bulls to vaccine virus.

Pilot IBR programme

During 2018, herds participating in Phase Three of the Teagasc/Irish Farmers Journal BETTER Farm Beef Programme enrolled in the first phase of a Pilot IBR programme. The IBR programme was developed by Animal Health Ireland's IBR Technical Working Group (TWG) in collaboration with Teagasc. The pilot comprised of sampling and testing the herds for IBR ('snapshot'), the application of an IBR on-farm veterinary risk assessment and management plan (VIBRAMP), and the provision of biosecurity and disease control advice.

Participating farms were initially screened by applying a herd 'snapshot', which required the sampling of 30 randomly selected animals over 9 months-old that were used or intended for breeding. Animals were tested with an IBR gE (marker) test that allows differentiation between vaccinated and infected animals. This sampling strategy has been applied in other IBR programmes (e.g. Belgium) as a cost-effective means to obtain an initial indication of the level of infection in a given herd and allows herd owners and the vets to review the biosecurity and make informed decisions on vaccination.

Pilot IBR results

Between 15 and 44 samples were submitted per herd, totalling to 909 samples. A large proportion of the seropositive results were from older, non-homebred animals (Figure 3). Fifty nine percent (17) of the herds had a negative snapshot test (defined as having only 0 or 1 seropositive animal - see "Interpretation of a snapshot test" below), of which 11 herds had zero seropositive animals and six herds had just one seropositive animal. The remaining 41% (12) of herds had a positive snapshot test (defined as 2 or more seropositive animals), of which three herds had two seropositive animals, eight herds had between 3 and 7 seropositive animals, and one herd had 14 seropositive animals.

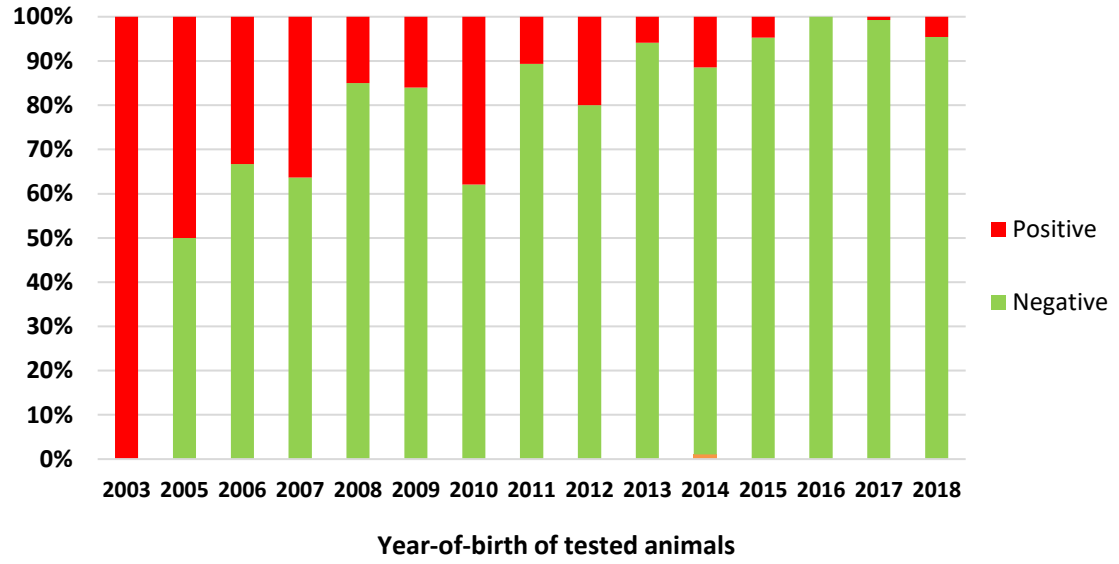

Figure 3. Percentage of negative and positive IBR gE (marker) individual results by year-of-birth within the Pilot IBR programme.

Herds with positive snapshot tests had, on average, a greater number of animals than negative herds, and also had a greater number of animals introduced directly from other herds (moves from farm). One-third of herds that had a negative snapshot test, and 77% of herds with a positive snapshot test, were vaccinating for IBR. Most of the vaccinating herds reported carrying out the vaccination to prevent clinical disease and to be vaccinating young stock only.

DAFM's National Beef Welfare Scheme

DAFM's National Beef Welfare Scheme (NBWS) is a support measure designed to enhance animal health and husbandry on suckler farms. The scheme includes two mandatory actions: meal feeding suckler calves in advance of and after weaning, and testing for the presence of IBR.

As with the Pilot IBR programme, the IBR snapshot in the NBWS 2023 is a cost-effective means to obtain an initial indication of the IBR status of the herd and the effectiveness of any control measures in place in a given herd. The snapshot test requires the sampling of 20 randomly-selected animals over 9 months-old that are used or intended for breeding. As with the Pilot IBR, animals are tested with an IBR gE (marker) test.

Interpretation of an IBR snapshot test

A direct correlation exists between the proportion of positive animals detected in the snapshot test and the actual proportion of positive animals in the herd (within herd prevalence). This information, together with analysis of the age of seropositive animals if detected, provides useful information to assess the risks and review the biosecurity of the herd to control IBR or to prevent re-introduction of the disease.

Low or zero prevalence herds

If the result of the snapshot test includes either zero or a single positive animal, the prevalence of infection within the herd is estimated to be between 0-15%. These herds have the option to test the remainder of the herd and either confirm freedom from IBR or identify and remove any positive animals, and to review vaccination and biosecurity measures.

These herds should review their biosecurity to minimise the risk of introducing the disease and, under veterinary guidance, consider introducing/extending/maintaining vaccination to the whole herd to reduce the impact from a reintroduction of the virus. Vaccination will not always be required.

Medium-to-high prevalence herds

If more than two seropositive animals are identified by the snapshot test, the within-herd prevalence of infection is likely to be greater than 15%. For these herds it may not be feasible to immediately achieve freedom from IBR by testing and removal of all seropositive animals. Nevertheless, a vaccination and biosecurity plan can be put in place to control the disease, leading to a reduction in prevalence until the point where this does become feasible.

Control of IBR

It is important to know whether you have IBR in your herd or not so that you and your vet can design the most appropriate health plan. In the absence of control measures, IBR

usually remains in a herd for a long period once it is introduced, because all infected animals become 'latent carriers' for life.
Herds with medium-to-high levels of infection should consider introducing whole-herd vaccination. Over time, with appropriate biosecurity measures, the prevalence should decrease as carrier animals leave the herd and are replaced by uninfected animals.
Herds where animals are purchased from multiple sources and are mixed after purchase are especially at risk of respiratory disease outbreaks, with IBR being one of the key viruses involved. Transport and mixing can result in outbreaks of IBR following reactivation of latent infection and spread to susceptible animals. Vaccination, (ideally in advance of movement or on arrival on farm), along with measures to reduce stress during transport and following arrival can help control these outbreaks.
The benefits of IBR control include improved herd health and production, increased efficiency in terms of greenhouse gas emissions, reduced antibiotic usage, the ability to sell animals into semen collection centres, and the ability to export live cattle to countries that are IBR free (or which have recognised control programmes).

Preventing IBR getting into your herd
Closed herds have the lowest risk of introducing IBR but if you have to bring animals into your herd (including animals returning from shows or the mart), isolate these for four weeks and test for IBR antibodies before they join the herd. Only negative animals should enter negative herds.
Avoiding mixing 'home' stock with cattle from other farms at pasture, housing or during contract-rearing will help prevent accidental introduction of infection. As the virus is also capable of being transmitted indirectly through equipment and people, it is important to maintain good hygiene of shared equipment and facilities, use separate clothing or ensure appropriate cleaning and disinfection of boots and clothing.
Good building design, ventilation, stocking density, ensuring good nutrition and low stress environments are key.

Vaccines
IBR vaccines are very good at preventing clinical signs and reducing the amount of virus shed following infection and reactivation, but they do not prevent viruses from causing a limited infection. A range of IBR vaccines containing either live or inactivated virus are licenced for use in Ireland. All of them are 'marker' gE-deleted vaccines. This means that, when used with an appropriate test, it is possible to distinguish between animals positive due to vaccination and animals positive due to infection with IBR.
Vaccination makes it less likely that a latent carrier will reactivate and shed the virus, and less likely that a naïve animal will become ill and spread the virus after exposure (Figure 4). Vaccination of negative herds can also be used as a way to reduce the impact of virus introduction, should this occur.
Since animals remain infected for life, older animals in a herd are more likely to be latently infected. Therefore, if we want to prevent those animals being the source of infection for other, typically younger stock in the herd, we must include them in our vaccination plan.
Whole-herd (including all breeding animals) and regular vaccination (according to manufacturers' recommendations and with the herd's veterinary practitioner's advice), will lead to a decrease in the percentage of infected cattle in a herd over a period of time, as older, positive cattle are displaced by younger, uninfected stock. This way, we reduce the risk of re-activation of the virus by positive, typically older cattle.

Decisions on which product and vaccination strategy to use in a particular situation should be made in consultation with your veterinary practitioner. Always read the datasheet provided with the vaccine to make sure that it is stored and used correctly, including being administered by the correct route (which may be up the nose, into the muscle or under the skin).

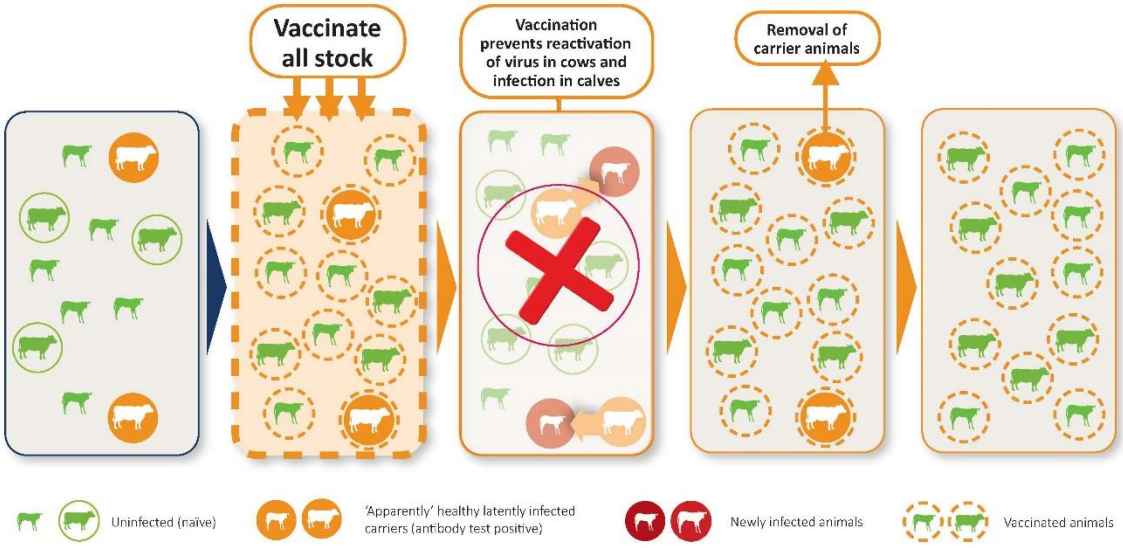

Figure 4. IBR control in a herd vaccinating all stock.

Further information

Detailed information leaflets on IBR and herd biosecurity, along with answers to frequently asked questions on IBR and specific guidance for herds with bull calves that are potential AI sires, are available on at http://animalhealthireland.ie/?page_id=377.