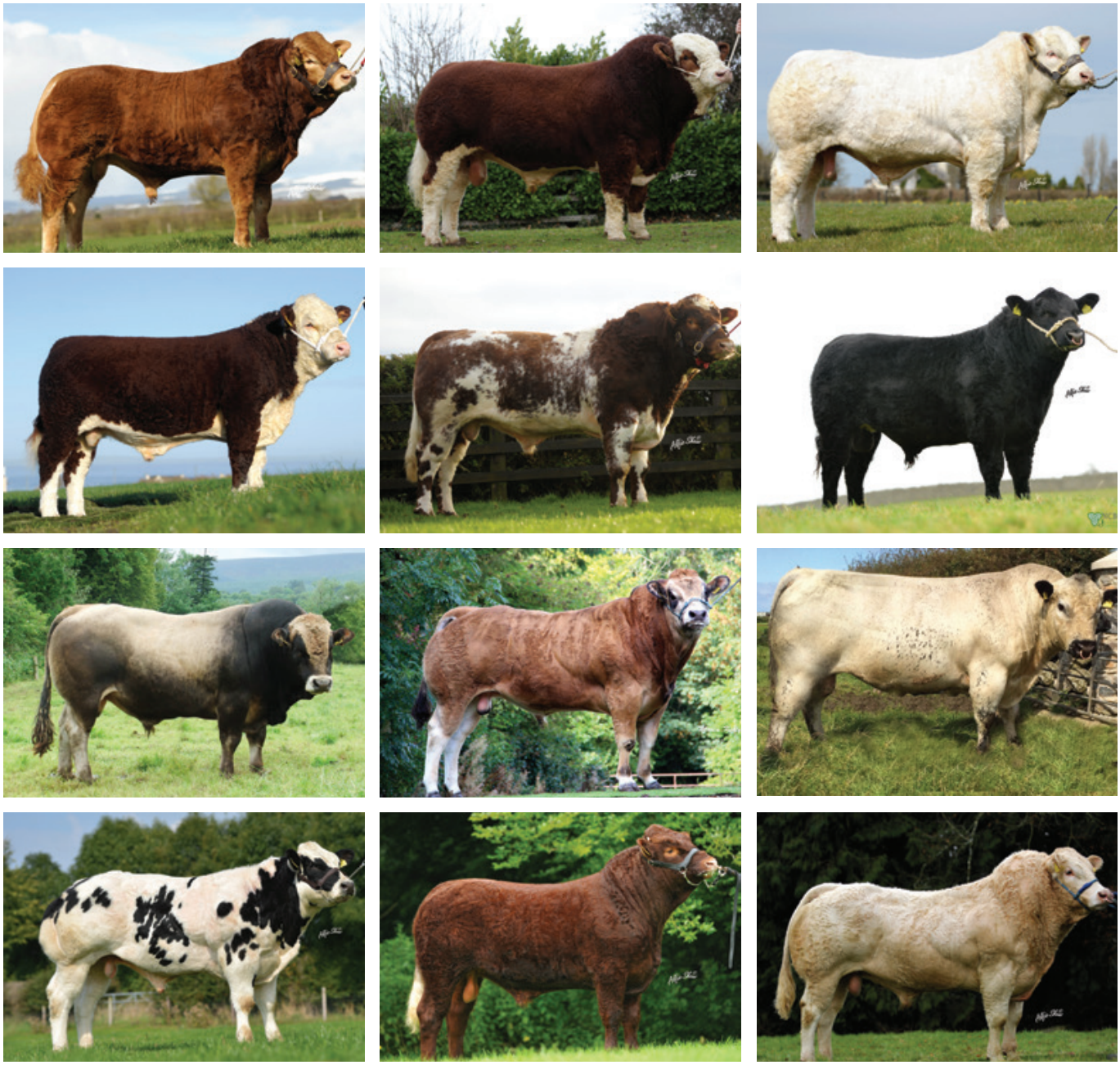
IBR LEAFLET SERIES

ANIMAL HEALTH IRELAND

Contributing to a profitable and sustainable farming and agri-food sector through improved animal health

A technical guide for veterinary practitioners and breeders of beef bull calves with potential for use as AI Sires



IBR ERADICATION PROGRAMME

IBRFree Animal Health Ireland.ie

Animal Health Ireland, 4-5 The Archways, Carrick-on-Shannon, Co. Leitrim, N41 WN27

AHI gratefully acknowledges the financial and other contributions of our stakeholders.

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Introduction

The delivery of high genetic merit bulls for breeding programmes is essential if Irish breeders are to achieve sustained profit growth through 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 (Council Directive 88/407/EEC) to ensure that semen produced meets requirements for trade in Ireland and within the European Union. These standards require that bulls entering semen collection centres are free from a range of disease-causing agents that may be spread through semen, including the virus that causes infectious bovine rhinotracheitis (IBR)

Objective

This document provides advice on the health management of young beef bulls that are of potential interest to AI companies, their dams and the herds from which they come, with the aim of maximising the likelihood that potential beef AI bulls are free from infection with IBR.

This document focuses on IBR for two reasons:

1. IBR is the disease which most frequently results in bulls being rejected for entry to semen collection centres.
2. IBR is the disease which currently presents the greatest disease threat to semen collection centres.

Key Points

The screening process for entry to semen collection centres begins with testing of bulls before they enter the quarantine facility of the collection centre. Only animals that are entirely free from IBR antibodies are allowed to enter semen collection centres. Antibodies may be present for the following reasons:

- Infection: where the animal has been exposed to the IBR virus.
- Vaccination: The animal has produced antibodies in response to an IBR vaccine.
- Colostrum: The animal received antibodies through colostrum. (These may persist for up to 9 months of age). To avoid this, it is best practice to ensure that in the first 72 hours of life the calf only receives colostrum from a known IBR antibody-negative cow.

In addition, if your calf only receives colostrum from an IBR-antibody negative cow, it is most unlikely that the calf will become a sero-negative latent carrier (SNLC). This form of carrier is of particular importance because it is undetectable on a routine blood test. While these pose only a minor threat to your herd, they pose a particular risk for introducing the IBR virus to semen collection centres.

Vaccination programmes in herds that may put bulls into collection centres should only use marker vaccines (only marker vaccines are licenced for use in the Republic of Ireland).

NOTE: DO NOT VACCINATE POTENTIAL AI SIRES FOR IBR

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 very 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 IBR antibodies (MDA) from colostrum.

Identifying and purchasing potential AI sires

Only bulls with the highest genetic potential are selected for AI. Some high genetic merit bulls that otherwise would be selected are rejected on the basis of their IBR test results and thus fail to deliver their economic potential.

AI companies will preferentially purchase beef bulls for semen collection from herds that are IBR free. However, given that there is evidence that approximately 70% of Irish herds have had some level of exposure to IBR virus, semen collection centres are mainly focused on the bull and its dam being IBR-free.

In Ireland, beef bulls have traditionally been purchased by AI companies when they are between 8 and 20 months of age. However, with the increased use of genomics in beef herds, potential beef AI sires will increasingly be identified prior to birth, giving the greatest possible opportunity to manage the calf and its dam appropriately. To minimize the possibility of a potential AI sire not being selected for entry due to the results of IBR tests, the goal is to have calves that test negative for antibodies at 42 days of age. All of the steps apply particularly to bull calves BUT high genetic merit heifer calves are equally worth protecting from IBR to help progress the herd's future health status.

Veterinary Technical Box

The use of live intra-nasal vaccine has the potential to accidentally infect potential AI sires, resulting in an antibody response that will prevent their entry to a semen collection centre.

See Q12 in the '**IBR: FAQ**' leaflet for further information on vaccine types.

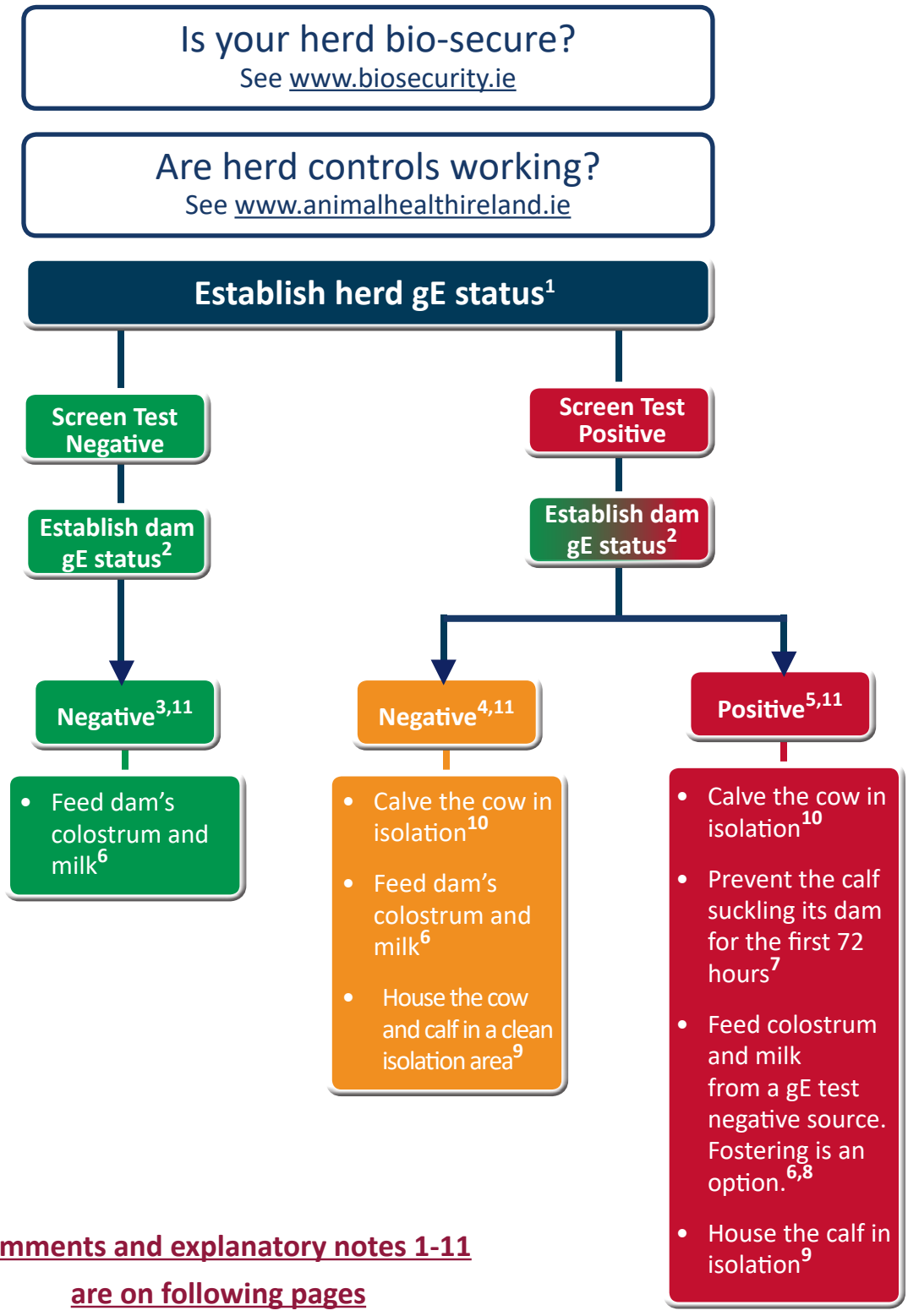
The following flow charts provide guidance on the investigative and management steps to follow, depending on whether or not you have a IBR vaccination programme in place and also the results of previous testing.

ALWAYS DISCUSS YOUR VACCINATION PROGRAMME WITH YOUR VETERINARY PRACTITIONER

Vaccinating Herds

Figure 1 provides a step by step guide on how to protect potential AI sires in a vaccinating herd from IBR, beginning with an investigation of herd status. Further information is available from **IBR - An Information Leaflet for Irish farmers, advisors and vets.**

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



Comments and explanatory notes 1-11 are on following pages

Figure 1 comments and explanatory notes:

1. Establish your herd status by using a gE screening test. To identify all animals that are latently infected, or to be sure that your herd has no test-positive animals, the entire herd should be tested. If testing is to achieve or maintain a herd certification then the numbers to be tested will be dictated by the provider of the certification scheme. However, testing a proportion of the herd can be a useful means of screening the herd to estimate prevalence of infection (ensure that the dams of all potential AI sires are included in the animals sampled).

Veterinary Technical Box

Testing a proportion of the herd

Accurately estimating how many animals are IBR antibody positive i.e. latently infected carriers is helpful in deciding what sort of control programme is most appropriate. Ensure that the dams of all potential AI sires are included in the herd screen. Note that while a negative result on a partial herd screen is consistent with a prevalence of infection of less than 10%, it does not necessarily mean that the herd is truly free from infection.

How many animals should be tested?

Table 1 gives the appropriate number of animals from the breeding herd across all management groups to be blood sampled and tested to estimate the prevalence of infection in the sample groups to an accuracy of +/- 10%. This is a valuable investigation tool to estimate prevalence and inform a decision on the most appropriate control strategy.

Test	Herd Size						
	<25	25-35	36-50	51-75	76-125	126-175	>176
Whole virus / gB	19	24	30	37	46	51	57[1]
gE	20	26	33	42	54	62	71[2]

Table 1. Appropriate sample size for estimating prevalence of IBR in non-vaccinating (gB) and vaccinating (gE) herds. Add 2 per every additional 100[1] ; Add 9 for every additional 100[2]; Shaded boxes = for small herds test all animals up to the number shown

Note that the lower sensitivity of the gE ELISA test relative to the gB/whole virus test means that a higher number of animals must be tested to obtain the same degree of confidence in the results. For further information see **IBR - FAQ**

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. A calf from a cow with a negative gE result within a vaccinating herd with a negative gE screen has the lowest risk of IBR exposure.

4. Calves from gE-negative cows in a herd with a positive gE screen test will have an a higher risk of being exposed. In this case other animals in the herd are the main potential source of infection (although this is reduced by the use of vaccine).

5. A calf from a cow with a positive gE result in a herd with a positive gE screening test has an even 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. The use of IBR vaccine should markedly reduce the risk of the dam (and other animals) shedding virus and infecting her calf.

Figure 1 comments and explanatory notes continued:

6. In a vaccinating herd where the dam tests negative for gE antibodies the calf may receive the dam's colostrum and milk. While the calf will absorb maternally derived antibodies to the IBR vaccine virus, it will continue to test negative for gE antibodies, providing strong evidence that it has not been infected with the virus and that it is not a carrier.

7. If the dam has tested gE positive prevent the calf from suckling its mother for the first 72 hours but allow maternal bonding to occur if the calf is to be returned to the dam. Be aware that the cow should be milked out appropriately during this period.

8. When dealing with a potential AI sire feed the calf gE-negative colostrum/milk for the first 72 hours, and then the calf can be returned to its mother. Blood test other heifers or cows that will calve before the dam of the potential AI sire to identify gE-negative animals that can be used as colostrum donors. Note that younger animals are more likely to test negative. Note that in a vaccinating herd even colostrum from gE-negative donors will contain some antibodies to the vaccinal virus. If the calf is fed this colostrum, it will have detectable 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. Nonetheless it is better to preferentially feed gE-negative (rather than gE-positive) colostrum (first milk collected within 6 hours of calving). Other alternatives are to foster the calf onto a gE-negative surrogate dam or to continue to feed it on milk replacer. Note if you choose to use milk replacer it may contain antibodies to IBR virus but these should not be absorbed from the gut after the calf is 2- 3 days old. **If feeding colostrum from other cows or using a foster mother 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 infected colostrum). It is recommended that farmers maintain records of all incidences where an alternative colostrum source was used.**

9. House the cow and calf in a clean isolation area. Two or more calves of similar status can be kept together, along with their dams. Where the dam is gE-positive, isolating the calf apart from its dam minimizes the risk of the dam infecting the calf.

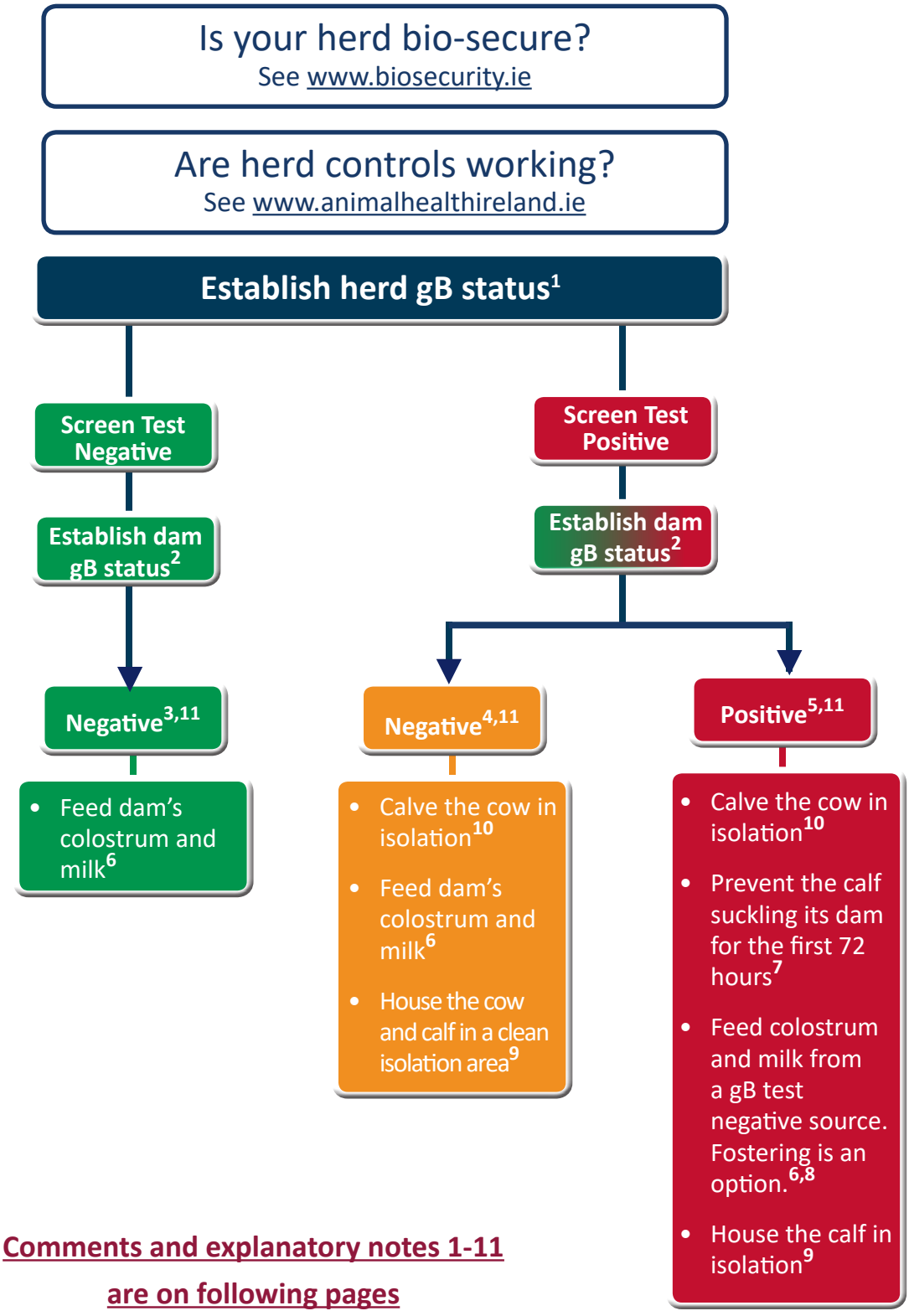
10. To reduce the risk of calves being infected at birth, calving should take place in individual calving boxes (no contact with other animals) that are clean, dry and have been disinfected.

11. See www.biosecurity.ie for more information on biocontainment and isolation, and www.calfcare.ie for management suggestions for calving and calf rearing.

Non-vaccinating herds

Figure 2 provides a step by step guide on how to protect potential AI sires from IBR in a non-vaccinating herd, beginning with an investigation of herd status.

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



Comments and explanatory notes 1-11 are on following pages

Figure 2 comments and explanatory notes:

1. Investigate the IBR status of your herd using a gB (or whole virus) antibody test. To identify all animals that are latently infected, or to be sure that your herd has no test-positive animals, the entire herd should be tested. If testing is to achieve or maintain a herd certification then the numbers to be tested will be dictated by the provider of the certification scheme. However, testing a proportion of the herd can be a useful means of screening the herd to estimate prevalence of infection (ensure that the dams of all potential AI sires are included in the animals sampled). For further information on herd testing strategies see **'IBR- An information leaflet for Irish farmers, advisors and vets'** and the Veterinary Technical Box on page 5.

2. In non-vaccinating herds the IBR 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 herd screen result has the lowest risk of exposure to the virus.

4. Calves from cows with a negative gB result in a herd with a positive gB screening test will have a higher risk of being exposed. In this case other animals in the herd are the main potential source of infection (with this risk increased by the absence of a vaccination programme).

5. A calf from a cow with a positive gB result in a herd with a positive gB screening test 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.

6. In a non-vaccinating herd where the dam tests negative for gB antibodies the calf may receive the dam's colostrum and milk.

7. If the dam has tested gB positive prevent the calf from suckling its mother for the first 72 hours but allow maternal bonding to occur if the calf is to be returned to the dam. Be aware that the cow should be milked out appropriately during this period.

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 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. Other alternatives are to foster the calf onto a negative surrogate dam or to continue to feed it on milk replacer. Note if you choose to use milk replacer it may contain antibodies to IBR virus but these should not be absorbed from the gut after the calf is 2- 3 days old. **If feeding colostrum from other cows or using a foster mother 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 infected colostrum). It is recommended that farmers maintain records of any incidences where an alternative colostrum source was used.**

9. House the calf in a clean isolation area. Two or more calves of similar IBR exposure status can be kept together. Where the dam is gB-positive, isolating the calf apart from its dam will minimize the risk of the dam infecting the calf.

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. See **www.biosecurity.ie** for more information on biocontainment and isolation, and **www.calfcare.ie** for management suggestions for calving and calf rearing.

Should I vaccinate for IBR?

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

If you are vaccinating, do not vaccinate potential AI sires for IBR. Vaccinated animals will have IBR antibodies and all vaccinated bulls 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.

IBR Vaccines

Only marker vaccines are licenced for use in the Republic of Ireland, while both marker and conventional non-marker vaccines are licenced in Northern Ireland. These non-marker vaccines do not allow differentiation of animals which have been vaccinated from those that have been infected naturally and are illegal for use in the Republic of Ireland. Note that combination vaccines licenced in Northern Ireland may include non-marker IBR vaccines. Generally calves born in infected vaccinated herds are at lower risk of becoming infected than those born in infected, non-vaccinating herds, due to the lower level of virus circulation in these herds.

Exhibiting of Cattle

The exhibiting of cattle at Shows and Sales represents a high risk in relation to the IBR status of both your animals and herd where appropriate measures are not in place. See **www.biosecurity.ie** for more information on biosecurity.

Checklist

Before Calving:

- [ ] Identify potential pregnancies of interest (i.e. pregnancies that could produce a potential AI sire).
- [ ] Carry out a herd screening test to establish IBR status of herd and dams
- [ ] Identify another source of negative colostrum or a foster dam if required. (gE negative in a vaccinating herd, gB negative in non-vaccinating herd)
- [ ] Prepare the isolation area for calving and calf rearing.

At calving:

- [ ] Isolate the dam and calf (if necessary)
- [ ] Ensure the calf receives colostrum from a dam with gB negative (gE negative in vaccinating herd) IBR antibody status

After calving:

- [ ] Isolate the calf or calves of interest (with their dams if these are non-infected).

NOTES

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