

# National Perspectives on IBR

## Control and Eradication in Belgium and The Netherlands

Report of the infectious bovine  
rhinotracheitis (IBR) Technical Working  
Group (TWG) of Animal Health Ireland  
on a study visit to Belgium and the  
Netherlands 2015.



Supported by the Golden Jubilee Trust

---

## **Report of the infectious bovine rhinotracheitis (IBR) Technical Working Group (TWG) of Animal Health Ireland on a study visit to Belgium and the Netherlands to examine national perspectives on IBR control and eradication.**

---

Supported by the Golden Jubilee Trust

Dr David Graham

Dr Stephen Conroy

John Fagan

William Fitzgerald

Tim Geraghty

Dr Maria Guelbenzu

Dr Elizabeth Lane

Donal Lynch

Colin Mason

Mary Newman

Dr Ronan O'Neill

Dr Michael Gunn



Animal Health Ireland,  
4-5 The Archways, Carrick-on-Shannon, Co. Leitrim, N41 WN27  
071 9671928, [admin@animalhealthireland.ie](mailto:admin@animalhealthireland.ie)  
[www.animalhealthireland.ie](http://www.animalhealthireland.ie)

## Contents

## Page

<b>1. Executive summary</b>	02
<b>2. Ireland: Conclusions and recommendations</b>	05
<b>3. Introduction and Context</b>	07
<b>4. Belgium</b>	10
A. Livestock sector	10
B. History of and drivers for IBR control	11
C. Programme description	11
D. Organisations and individuals involved; roles and responsibilities	13
E. Costs and Funding	14
F. Laboratory testing and data management	16
G. Vaccination	17
H. Progress to date	18
I. Future development and goals	20
J. Lessons learned	20
<b>5. The Netherlands</b>	21
A. Livestock sector	21
B. History of and drivers for IBR control	22
C. Programme description	23
D. Organisations and individuals involved; roles and responsibilities	25
E. Costs and funding	25
F. Laboratory testing and data management	25
G. Vaccination	26
H. Progress to date	26
I. Future development and goals	27
J. Lessons learned	28
<b>6. Ireland: Conclusions and recommendations</b>	29
<b>Appendices</b>	31
Appendix 1: Itinerary of IBR study visit	31
Appendix 2: Details of Belgian, Dutch and Irish delegates	34
<b>References</b>	37

# 1

## EXECUTIVE SUMMARY

- **INFECTIOUS BOVINE RHINOTRACHEITIS (IBR)** is primarily a viral respiratory disease of cattle spread by nose to nose contact or through the air. It can also be shed in semen and transmitted venereally. Following recovery, cattle are considered to be lifelong carriers of the virus which can be shed intermittently from the airways and reproductive tract thereafter.
- Infection with IBR virus is widespread in Irish dairy and beef herds, with evidence of exposure in over 70% of herds.
- Current EU legislation prohibits bulls with evidence of exposure from entering semen collection centres for the purposes of intra-community trade.
- A number of EU Member States (MS) have completed IBR eradication programmes, or have such programmes underway. MS may submit their programmes for eradication or demonstration of freedom to the Commission for approval. Where approval is given, MS are granted additional guarantees in relation to intra-community trade.
- Losses due to IBR may accrue due to disease (both clinical and sub-clinical), the impact on semen collection centres (both exclusion of high genetic merit sires and the catastrophic losses where biosecurity is breached and infection introduced) and the loss of live export markets due to an inability to satisfy the additional guarantees required to trade with the relevant MS.
- Foodwise 2025 states that, subject to a favourable cost benefit (currently underway), a national eradication programme will be initiated in 2019.
- IBR is prioritized for action by Animal Health Ireland (AHI). A Technical Working Group (TWG) of AHI is currently considering options for such an eradication programme. To inform its discussions, the TWG undertook a study visit to Belgium and the Netherlands in September 2015.
- In the programme in both countries, twice yearly vaccination plays a central role, supported by a companion test which allows vaccinated and infected animals to be differentiated.



- In both countries the programmes are owned and led by the farming industry, in partnership with the government and the veterinary profession, with this being identified as critical to success. Key drivers for control have been the maintenance of live export markets, avoidance of losses due to disease and improved animal health, maintaining trade in semen and embryos and reducing antimicrobial use.
- Belgium began a compulsory national eradication programme in 2012, preceded by a voluntary period lasting 5 years. The programme was approved by the Commission in 2014 when Article 9 status was awarded. Live exports from Ireland to Belgium have essentially ceased as a consequence.
  - o IBR-free herds with no evidence of exposure are assigned an I-4 status; those which are free but in which vaccine has been, or currently is, used are assigned an I-3 status. Herds that are still infected and vaccinating (twice yearly) are assigned an I-2 status.
  - o The programme has made more rapid progress in Wallonia (southern Belgium) than in Flanders (northern Belgium). In part this is considered due to a greater use of vaccine in Flanders, with herds acquiring (and remaining at) I-2 status. In Wallonia, more use was made of a “snap shot” herd screen to get an initial serological picture, allowing many herds of previously unknown status to progress to I-3 or I-4 status.
  - o The programme is managed in Flanders by Dierengezondheidszorg Vlaanderen (DGZ) and in Wallonia by the Regional Association of Animal Health and Identification (ARSIA).
  - o Testing to award and maintain statuses is carried out in accordance with 2004/558/EC, with the exception that a partial herd test, based on epidemiological principles, is carried out to maintain I-3 and I-4 status, rather than a whole herd test.
  - o Each herdowner appoints an “Epidemiological Surveillance” (ES) vet, from whom they obtain vaccine and who is responsible for initial investigation and sampling of suspect outbreaks. The ES vet also administers the vaccine, although this may be devolved to the herd owner. ARSIA maintains records of vaccination at animal level, while DGZ maintains records at herd level. The compulsory programme has made good progress with herd- and animal-level prevalence decreasing from 52% and 22% respectively in 2011 to 18% and 4% in 2015. A roadmap to eradication has been developed which will implement a series of additional control measures, with the goal of freedom (and Article 10 status).
- The Netherlands began a compulsory eradication programme in 1998, following several years of voluntary control. The programme design was based on the outcomes of economic and scenario modelling.
  - o During the first phase of the programme (reduction phase) all herds had to be vaccinated by a vet unless they were able to obtain a dispensation from vaccination. These dispensations were available, subject to conditions, for all animals in herds that could demonstrate evidence of being IBR-free, and for non-breeding beef herds/veal units; in vaccinating herds groups of young stock which could be shown to be IBR-free could also obtain a dispensation from vaccination.
  - o All serological testing was conducted using the gE ELISA. Extensive and frequent use was made of bulk tank milk testing for monitoring of free herds. Acknowledged limits in sensitivity were considered to be satisfactorily overcome by frequent testing, with epidemiological studies indicating that introduction of infection to a naïve herd would be quickly detected and onward spread limited.
  - o Testing of three animals per-sub-population was used to confirm freedom from infection in suckler herds and in young stock seeking dispensation from vaccination.

- o By 1999 the programme was making good progress with 25% of dairy herds and 18% of other herds having achieved an IBR-free status. A further 26% of dairy herds and 67% of other herds had a within herd prevalence of <10%.
- o The compulsory programme was stopped suddenly in 1999 following the death of cows on a limited number of farms due to contamination of live IBR vaccine with BVDV type II.
- o Many herds continued voluntarily with the programme and in 2006 a voluntary IBR-free programme and a voluntary IBR monitoring programme were introduced. These are primarily aimed at dairy herds and again make extensive use of BTM testing. 28% of dairy herds are certified as IBR-free with a further 15% in the monitoring programme.
- o Preparatory work has been undertaken to prepare for a possible new national eradication programme. Initial modelling work supports the use of BTM sampling in dairy herds and abattoir surveillance in suckler herds, while acknowledging that such an approach is not aligned with current EU requirements.



# IRELAND

## 2 Conclusions and recommendations of the IBR TWG

1. **A STUDY** on losses to Irish farmers due to IBR is currently underway and the outputs of this work will inform the benefits element of a cost:benefit analysis (CBA) for a national IBR eradication programme. The IBR TWG is currently developing options for an eradication programme. Costs of each of these options will be determined, informing the cost element of the CBA. In addition to the testing regimes for acquisition and maintenance of a free herd laid down by 2004/558/EC, further options should consider the use of a snap shot to determine herd status with a view to avoiding herds unnecessarily embarking on vaccination programmes, the sampling of limited numbers of animals for maintenance of free herd status (both used in Belgium) and the use of bulk tank milk and abattoir surveillance as used in the Dutch programme.
2. If a voluntary phase is to be included in a national programme, it should be of limited duration (no more than one year).
3. Both Belgian and Dutch farmers have taken ownership of addressing IBR. Their role in driving and supporting the IBR eradication and control programmes is one of the key factors in the success of the programmes in these countries.
4. Scenario and economic modelling should be used as part of the CBA of each eradication option. These should at minimum include the testing regime as defined by 2004/558/EC along with the approaches taken in Belgium and the Netherlands.
5. The impact of the new Animal Health Law on future IBR programmes, including the mechanism by which a country could apply for formal recognition of an eradication programme (or freedom), permitted testing and surveillance options and the continued availability of additional guarantees in relation to intra-community trade, should be clarified as quickly as possible, with consideration given to the use of output-based measures.

6. While both Belgium and the Netherlands recognise the need to control IBR as a disease, freedom to trade through obtaining Article 9 status is a major driver for both countries. Paradoxically they also recognise that Article 9 (or 10) statuses impose limitations in relation to importing stock. This is considered to be less of an issue for Ireland, given the limited number of imported animals, but also needs to be recognised, particularly in relation to trade with Northern Ireland.
7. While a formal decision on the implementation of a national programme in Ireland remains to be taken, planning and implementation of a number of measures should be considered at this stage.
  - a. Implementation of a national programme in Ireland will have as an initial objective the obtaining of Article 9 status. An application will have to provide information to address a series of points laid down in 64/432/EEC, including a system for notification of IBR outbreaks and providing data on the distribution of the disease. Consideration should be given to progressing both of these requirements, including undertaking additional surveys, if required, to determine prevalence. The winter screening programme conducted annually in Belgium provides a template for ongoing surveillance, but consideration should be given to using other matrices and sample types such as bulk tank milk.
  - b. The Central Veterinary Research Laboratory should be formally recognised as the National Reference Laboratory for IBR and resources and functions assigned, including approval of test methods, determination of the sensitivity and specificity of diagnostic tests for blood and milk (including bulk tank samples) and development and implementation of protocols to manage aspecific results.
  - c. Consideration should be given to development of a national database capable of recording herd vaccination details and managing herd statuses.
  - d. Given that the majority of live imports come from Northern Ireland, Animal Health and Welfare NI (AHWNI) should be encouraged to consider an IBR eradication programme in NI and the Department of Agriculture and Rural Development encouraged to prohibit the use of non-marker vaccines. Steps should also be taken to raise awareness of the legislative prohibition on the use of non-marker vaccines in Ireland.
  - e. In advance of any national programme, establish a pilot programme, based on the requirements of 2004/558/EC to allow herds that wish to do so to acquire a formal IBR-free status.



# 3

## INTRODUCTION AND CONTEXT

**INFECTIOUS BOVINE RHINOTRACHEITIS** (IBR) is a viral disease of cattle. The primary route of transmission of the virus is animal to animal spread by the respiratory tract. Disease is characterised primarily by respiratory disease, milk drop and abortion. Following infection and recovery, cattle are lifelong carriers, with the potential to shed the virus intermittently, particularly at times of increased stress.

The virus may also be shed in semen and transmitted venereally and for this reason bulls with evidence of exposure to IBR virus (including vaccine virus) are prohibited from entry to semen collection centres for the purposes of intra-community trade<sup>1</sup>. Entry of the virus to the semen collection centre of the National Cattle Breeding Centre (NCBC) at Enfield, Co. Meath in 2011, resulted in the culling of all bulls present.

A number of European countries have embarked upon, or completed, eradication programmes for IBR. Member states of the European Community which have a compulsory national IBR control programme in place may submit details of the programme to the Commission for approval according to the requirements set down in Article 9 of Council Directive

64/432/EEC<sup>2</sup>. Similarly, Article 10 of this Directive allows countries which consider themselves free of IBR to submit evidence seeking official recognition of freedom. In both cases, the Directive provides for countries with approved eradication programmes, or freedom, to seek additional guarantees, relating to intra-Community trade, to assist with efforts at eradication or maintenance of freedom. These guarantees must not exceed those which the Member State implements nationally. Full details of the additional guarantees relating to IBR are defined in Commission Decision 2004/558/EC<sup>3</sup>. Essentially cattle moving into Member States with an approved (Article 9) programme or IBR-free status (Article 10) must come from an IBR-free territory (Article 10 status) or satisfy the following conditions:

- (a) they must come from a holding on which, according to official information, no clinical or pathological evidence of infectious bovine rhinotracheitis has been recorded for the past 12 months;
- (b) they must have been isolated in a facility approved by the competent authority for 30 days immediately prior to movement and all bovine animals in the same isolation facility must have remained free of

clinical signs of infectious bovine rhinotracheitis during that period;

(c) they and all other bovine animals in the same isolation facility must have been subjected with negative results to a serological test carried out on blood samples for IBR.

Four derogations are provided under which cattle may move to countries with approved (Article 9) programmes from other countries with Article 9 programmes or with no approved programme. 2004/558/EC also lays down detailed guidance on the sample types (individual bloods, pools of individual milks and bulk tank milk), animals and testing frequency required for a holding to acquire and maintain an IBR-free status.

Annexes 1 and 2 of 2004/558/EC list countries and regions with Article 9 and Article 10 programmes. This list is regularly updated, most recently as COMMISSION IMPLEMENTING DECISION (EU) 2015/250<sup>4</sup>. At the time of publication of this Decision (13th February 2015), the following countries had approved programmes/freedom:

Article 9: Belgium, Czech Republic, all regions of Germany except the Federal States of Bavaria, Thuringia, Saxony, Saxony-Anhalt, Brandenburg, Berlin and Mecklenburg-Western Pomerania, and in Italy the regions of Friuli-Venezia Giulia and Valle d'Aosta and the Autonomous Province of Trento.

Article 10: Denmark, in Germany the Federal States of Bavaria, Thuringia, Saxony, Saxony-Anhalt, Brandenburg, Berlin and Mecklenburg-Western Pomerania, in Italy the Autonomous Province of Bolzano, Austria, Finland and Sweden.

The potential for restriction of live exports from Ireland should trading partners acquire Article 9 or 10 status is illustrated by the change in numbers following Belgium's acquisition of Article 9 status in October 2014. In 2014 a total of 21,360 animals were exported to Belgium up to 10<sup>th</sup> October. During the same period in 2015, exports were reduced by 97.8% to 473<sup>5</sup>.

The Council of the EU has recently published a proposal for a Regulation on transmissible animal diseases (the Animal Health Law)<sup>6</sup>. In time it is expected that this single piece of legislation will consolidate and replace much of the current legislation. While many of the details, including the diseases that are listed and the means of surveillance remain to be provided, it is expected that recognition will continue to be provided for countries that are free, or engaged in the eradication of IBR.

IBR is prevalent in Ireland, with evidence indicating that approximately 75-80% of beef<sup>7</sup> and dairy<sup>7,8</sup> herds contain cattle that have been exposed at some point and are carriers of the virus.

There is currently no specific legislation in Ireland addressing IBR eradication. However, since 2002 only marker vaccines may be marketed<sup>9</sup>. When used with a companion (gE) test, it is possible to distinguish animals that are vaccinated but not infected from animals that have been infected.

A study of experts and farmers about non-regulatory animal health issues facing Irish livestock industries identified IBR as one of a number of priority issues to be addressed<sup>10</sup>.

AHI has established a technical working group (TWG) on IBR which has to date focussed on the development of a number of resources providing evidence-based best practice for dealing with IBR at farm level<sup>11</sup>. The next step is to consider the merits or otherwise of addressing IBR at a national level. Reflecting this, the AHI Strategic Plan 2015-2017<sup>12</sup> contains the following on IBR:

---

### Programme objective

---

*To eradicate infectious bovine rhinotracheitis (IBR/ BoHV-1) from the national herd, subject to a positive cost-benefit analysis and a mandate from AHI stakeholders.*

## Strategic objectives

Key outcomes to be achieved in the lifetime of the current strategic plan:

- *Develop a framework for a national control programme, consistent with the requirements for such programmes, as established in EU legislation.*
- *Complete a cost-benefit analysis (CBA) for a national IBR eradication programme.*
- *Taking into account the outcome of the CBA, seek a mandate from AHl stakeholders on whether or not to progress to a national eradication programme.*
- *Subject to a mandate from stakeholders, commence the implementation of a national communications strategy and other initial elements of the eradication programme.*

In addition, the Animal Health section of the Foodwise 2025<sup>13</sup> document which presents a 10 year vision for the Irish agri-food sector published in 2015 by the Department of Agriculture, Food and the Marine (DAFM), contains the following undertaking:

*“DAFM to support the carrying out an economic appraisal by Teagasc of the benefit/costs of implementing a compulsory national IBR eradication programme for consideration by AHl and its stakeholders with the expectation that if the outcome shows a favourable return on resource deployed that a national eradication programme will be initiated by 2019.”*

Work on the economic appraisal, focussing on losses incurred by the industry due to IBR, began in 2015 with initial results due in early 2016, with the resulting estimate providing the benefits to be achieved by eradication.

The IBR TWG has also begun considering options for the structure of a national control programme, with the goal of developing one or more options to be evaluated, taking into account factors including legislative requirements, cost, complexity and time to eradication. The costs of these options, along with

the benefits mentioned above, will provide the basis of a benefit/cost evaluation for each.

Considerable experience in IBR control already exists in Europe. To assist the TWG in the development of options for a national control programme, a study visit to Belgium and the Netherlands was undertaken from 7th to 10th September 2015. This provided an opportunity to meet with representatives from government, laboratories, industry, farmers and veterinary practitioners to gain insights into their current programmes, the drivers for their initiation, associated challenges and goals and lessons learned.

This report, supported by published material and responses to supplementary questions, provides a summary of the findings of the visit. Details of the visit programme, and of those attending the various meetings, are provided in Appendices 1 and 2 respectively.

# 4 BELGIUM

## A. Livestock sector

**BELGIUM** is a federal country comprising the two provinces of Flanders in the north and Wallonia in the south, plus the Brussels Capital Region.

Among beef breeds, the Belgian Blue is pre-dominant. However, French beef breeds are also increasing in importance, especially the Limousin, Blonde d'Aquitaine and Charolais.

Dairy cows are more common in Flanders while suckler cows are more common in Wallonia (Table 1). The dairy cow population is dominated by Holstein-Friesians (about two-thirds of the dairy cow population). While Flanders has a larger number of herds than Wallonia (15,350 and 10,201 respectively), the numbers of cattle are similar (1,358,629 and 1,237,060; 2,595,689 combined),

reflecting larger average herd size in Wallonia, which also has a higher overall cattle density. 4,501 herds in Flanders have ten animals or less. While the size of the cattle population has remained relatively stable over the past years, the numbers of herds has been decreasing gradually (~41,100 in 2006). The average number of cows in suckler and dairy herds is 53 and 66 respectively. Approximately 950,000 calves are born each year. The average population density is 80 cattle/km<sup>2</sup> <sup>14</sup>.

Identification and registration of cattle is performed through a central database (SANITEL) managed by the Federal Agency for the Safety of the Food Chain (FASFC).

Around 316,000 fattening calves (average age 20±17 days) and around 329,000 older animals (average age 2.69 years±2.59) are traded annually<sup>15</sup>.

	Dairy	Beef	Mixed	Total	Calves/yr	Herds
Flanders	656,096	600,066	102,467	1,358,629	-	15,350
Wallonia	352,126	788,527	96,407	1,237,060	-	10,201
Belgium	1,008,222	1,388,593	198,874	2,595,689	950,000	25,551
Ireland				6,135,172	2,131,048	116,323

**Table 1.** Comparison of cattle sectors in Belgium and Ireland



## B. History and drivers for IBR control

### History

1990s – Vaccines allowing the differentiation of infected and vaccinated (DIVA) animals (marker vaccines) were developed in the Netherlands. Epidemiological studies suggested that eradication programmes incorporating the use of marker vaccines were possible.

1997 – A voluntary programme was started simultaneously with the Netherlands (enabled by national legislation; Royal Decree [RD ] 08/08/1997). A serological survey indicated seroprevalences at farm and animal level of 67% and 35.9% respectively<sup>16</sup>. The marketing of non-marker vaccines was forbidden and restrictions on animal movement were introduced depending on herd status. The programme had limited uptake from farmers and practitioners, particularly from the beef sector.

2004 – Germany achieved Article 9 status, stimulating renewed interest in Belgium.

2005-06 – a series of IBR round table meetings were held between stakeholders to agree a new approach to control.

2007-2012 – A revised voluntary programme was introduced, supported by legislation (RD 22/11/2006) with a clear indication that the programme would become compulsory from 2012 onwards.

2012 – Launch of the compulsory programme, with all herds, excluding veal calf units, required to have a status of I-2 (see Programme description below for details) or above based on serological results or regular vaccination.

2014 – Belgium awarded Article 9 status on 8<sup>th</sup> October<sup>17</sup>.

### Drivers for IBR control

- Maintenance of live trade: Belgium is the second largest exporter of live beef cattle in Europe (~150 000 exported per year), of which 60-70% go to the Netherlands and the remainder to Germany, France and Italy.
- Maintenance of trade in semen and embryos
- Avoiding an increased IBR seroprevalence in imported animals from other countries running eradication programmes. (A view was also expressed that the restriction on imports was also a negative outcome, restricting supply of animals for veal and fattening units).

## C. Programme description

The ultimate aim of the programme is to achieve IBR eradication and Article 10 status. IBR is a compulsorily notifiable disease.

Herd qualification (categorization) is dealt with by the two regional animal health laboratories (ARSIA/ DGZ) for the Flanders and the Wallonia regions.

### Herd testing and classification

Herds are typically assigned to one of four main statuses based on test results or vaccination.

I-1 – Unknown status herds (not participating in testing or vaccination). These herds can only move animals directly to slaughter, must house cattle all year round and must avoid direct contact with animals from herds of higher status. This status will be withdrawn in 2016, with these herds required to progress to I-2 status. Veal units are currently exempt from the programme.

I-2 – Herds that have implemented a vaccination programme and are either known to be infected based on the results of blood testing or which have elected to vaccinate without initial blood testing. All animals must have completed a primary course of vaccination by 10 months of age (or within 35 days of entry) followed by hyperimmunisation (booster vaccination) at regular intervals (one to eight months) thereafter. Vaccinations must be logged onto the database run by the appropriate regional animal health association, which then manages the herd status. There is currently no requirement for regular monitoring (sampling and testing) of these herds.

I-2D- this is a transitional status that may be awarded for a maximum of 12 months to herds where an initial round of testing indicates that less than 10% of the herd is infected. In this case, only infected animals may be vaccinated with the goal of removing them within 12 months and progressing directly to I-4 status.

I-3 – IBR-free, based on two rounds of negative blood test results (using gE test) on samples of all animals aged 12 months and above at an interval of 4-7 months, with an annual test thereafter. While 2004/558/EC requires that all eligible animals are tested to maintain a free status, the programme requires sampling of a maximum of 26 animals per herd, with this number chosen to detect, with 95% confidence, at least one positive animal when the herd prevalence is 15% or greater. The sensitivity (Se) of the test is assumed to be 70% (i.e. 70% of infected animals will give a positive result) and the specificity (Sp) 100% (i.e. there will be no false positives). Herds with this status may continue to vaccinate if they wish.

I-4 – Officially IBR-free. To qualify, all animals over 12 months are individually blood sampled with negative antibody results (gB test) when tested twice 4-7 months apart to qualify, with an annual maintenance test thereafter sampling a maximum of 21 animals per herd, with this number chosen to detect, with 95% confidence, at least one positive animal when the herd prevalence is 15% or greater. The assumed Se and Sp of the test are 95% and 100% respectively. These herds are not permitted to vaccinate, and cannot contain animals that have been previously vaccinated (gB positive, gE negative).

Herds may progress directly to an I-4 status or evolve from an I-3 status, following a cessation of vaccination and removal of all vaccinated animals over time.

### **Herd snap shot**

Herds of unknown status that were not vaccinating were encouraged to perform a herd “snap shot” before deciding whether to vaccinate (obtaining I-2 status) or seek official freedom (I-4 status). This required the sampling of a maximum of 26 animals and testing by gB ELISA. This testing was

subsidized by the Animal Health Fund (see below) which contributed 50% of the cost. Where all results were negative (70% of cases) the herd was highly likely to be free, and could progress directly to I-4 status subject to completion of the additional herd screenings with negative results. Approximately 15% of herds had a small number of positives (1-4), with these typically being older animals. Removal of these (or adoption of an I-2D status) could again allow these herds to achieve I-4 status within a relatively short period. The remaining 15% of herds, with a higher seroprevalence, were recommended to vaccinate, acquiring an I-2 status.

### **Bio-exclusion controls**

There is an obligation on I-1 herds to avoid contact with higher status herds. Prescribed bio-exclusion measures for these herds include keeping cattle housed at all times and only moving cattle directly to slaughter.

Herds with I-3 and I-4 statuses must purchase only gE- (from I-2 or I-3 herds) or gB- (from I-4) negative animals to maintain their status. Purchased animals must be tested within 5 days of arrival and again 28-40 days after arrival, with derogation from the second test where the herd of origin also has I-3 or I-4 status. On a practical level this has led to reluctance to move to I-4 level, as the number of gB-negative bulls on the market is low. For this reason known-negative herds tend to stay at I-3 so that they have a wide selection of bulls to select from.

### **Suspect Outbreaks**

If there is suspicion of infection based on clinical signs, the farmer must contact his Epidemiological Surveillance (ES) vet (see below under D for details). If a diagnosis of IBR cannot be ruled out following a clinical examination they will collect samples and send these to DGZ/ARSIA (or CODA-CERVA) (see below under D for details) for virological analysis and notify the Federal Agency for the Safety of the Food Chain (FASFC).

Thereafter

- No movement is allowed, except to the slaughterhouse under permit from FASFC.
- All bovines must be kept inside or in a place without contact with any other holding/animals.
- Pending the test results, the herd status is suspended on SANITEL, with their herd assigned a status of I-0.
- Biosecurity measures on the farm are strengthened; personnel access to the farm is limited and a register must be kept of all visitors; protective clothing must be used by visitors and must not be taken off the farm; hands, footwear and vehicles must be disinfected.
- Where an outbreak is confirmed, notification is issued to all contact holdings and their veterinarians
- Measures are lifted *at the earliest* 30 days after notification by the vet of complete disappearance of clinical signs.
- After 30 days, an I-2 status is assigned to the herd if vaccination is performed. Alternatively the herd may test and cull to re-gain a higher status. Failure to act results in the herd becoming I-1.
- An epidemiological investigation is made by an FASFC investigator to determine the most probable origin of each outbreak. (Most are attributed to either the purchase of a positive animal [where quarantine was not applied] or reactivation of infection in an older carrier animal).
- The number of confirmed outbreaks has fallen from 11 in 2011 to one in 2014.

## D. Organisations and individuals involved; roles and responsibilities

- The Minister of Agriculture has ultimate responsibility for the following organisations, bodies and activities involved in the IBR eradication programme.
  - The Federal Public Service Health, Food Chain Safety and Environment (SPF SPSCAE [SPF]) has regulatory jurisdiction, having responsibility for the legislation in support of the programme. The SPF also manages the Animal Health Fund (see below under funding) and is responsible for the National Reference Laboratory for animal diseases (CODA-CERVA; see below).
  - The Federal Agency for the Safety of the Food Chain (FAFSC; Food Agency) was established in 2000. It is responsible for ensuring the safety of the food chain and the quality of food in order to protect the health of humans, animals and plants. It has powers to monitor compliance with the standards set by the SPF on animal health and disease, including IBR. It is also responsible for the implementation of official controls and outbreak investigations and for reporting to the European Commission and other European institutions. Official veterinarians of FAFSC are located in a number of centres in each province as Provincial Control Units (UPC; <http://www.favv-afsca.fgov.be/upc/>), being responsible for overall programme supervision and investigation of outbreaks.
  - The Centre for Study and Veterinary and Agrochemical Research (VAR; <http://www.coda-cerva.be/index.php?lang=en>) was established in 1997. It is the federal scientific establishment and serves as the National Reference Laboratory (NRL) for IBR. The NRL conducts mainly confirmatory testing and is responsible for quality control of diagnostic reagents used in regional laboratories as part of the official IBR eradication programme. The Coordination of Diagnostic Veterinary Epidemiological Research and Risk Analysis (CODA-CERVA) is a unit of the VAR. It provides expert advice to the IBR programme through membership of the IBR Technical Working Group (see below under funding) and carries out scientific research to maintain and expand this technical expertise. It also has a fundamental role in the management of the quality of testing carried out by recognised laboratories, including:
    - a. Authorisation of the commercial ELISA kits that can be used within the programme



- b. Performance of quality control for each batch of those kits
  - c. Delivery of mandatory proficiency tests to the recognised laboratories
  - d. Confirmatory testing by virus neutralisation test and ELISA of doubtful antibody test results and virus isolation and PCR testing of samples from suspect clinical outbreaks.
- Approved regional Animal Health associations. The Regional Association of Animal Health and Identification (ARSIA) and Dierengezondheidszorg Vlaanderen (DGZ) can be considered as official regional laboratories mandated by the FASFC to perform first line routine testing of samples linked with IBR certification in Wallonia and Flanders respectively. Each has its own laboratory and is also responsible for a range of administrative tasks, including recording of vaccination and assigning herd statuses. Further details on ARSIA were obtained during the visit as follows. It is a farmer-owned and run organisation representing some 24,000 farmers including 11,000 cattle owners. 240 delegates are members of a representative general assembly overseen by a 24-person executive board overseen in turn by a 6-person steering committee. Its two main areas of activity are managing animal identification and registration and animal health. The organisation has a budget of ~12M euro, of which 70% is derived from farmers, 18% from the government and 12% from the Animal Health Fund.
  - Herd owners and veterinary practitioners. The herd owner and their veterinary practitioner are recognised as critical elements of the programme. By law, each farm must have a nominated Epidemiological Surveillance (ES) vet to oversee regulated diseases including IBR. Vaccines must be obtained from, and blood samples taken by, the ES vet. The herd owner is required to notify the ES vet if they suspect an outbreak of IBR, with the ES vet then carrying out clinical examination and sampling. The ES vet also plays an important role in ensuring and enforcing optimal farm biosecurity. They must visit each herd at least

three times a year, rising to six times per year for herds with I-2 status. A substitute ES vet is also named in the event that the primary veterinary practice is unavailable. The strength and value of this contract is considered to lie in the mutual trust between the partnership of vet and farmer.

## E. Costs and Funding

The costs of the programme are typically borne directly or indirectly by farmers and the wider industry. Costs of vaccination, fees for private veterinary practitioners and laboratory charges are paid by the farmer. Some of these costs have been subsidized at points in the programme via the Animal Health Funds (see below), which have also contributed to the costs of programme administration. Government funds the cost of an annual sero-prevalence survey (winter screening; see H below for details) for a range of diseases, including IBR. The results of this screening provide an objective measure of national prevalence at both animal and herd levels. Vaccine costs are approximately €5/dose with a veterinary administration charge (where this option is taken) of ~€2.50/animal. Sampling costs are ~€2.50/animal and test costs are approximately €7.00/blood sample (before any subsidy from the Animal Health Funds). In ARSIA, farmers may pay a voluntary annual fee, the amount of which is based on herd size, to a “solidarity fund”. Contributors to this fund obtain a discount of approximately 50% on test costs.

Animal Health Funds (AHF) exist for the bovine, porcine, dairy, poultry, and small ruminant sectors, with the bovine sectoral fund in place since 1998. Each of the five funds was established to address animal health crises (including Brucellosis and Foot and Mouth Disease) and were designed to build up financial reserves to support future emergencies.

The Animal Health Funds are based on the principles of co-financing, co-responsibility and co-management by producers and government, with mandatory contributions from all breeders. Cattle owners pay a contribution which varies according to the health-related risks associated with the particular enterprise type or farming activity.



Farmers are invoiced once per year for the bovine fund based on herd data in SANITEL according to the schedule in Table 2. Approximately 95% of farmers pay the requested amount. Measures are currently being discussed to address non-payment by the remaining 5%. Where the charges are applied at 100%, they generate approximately €7M annually. However, when the reserve funds are adequate, the level at which charges are applied are reduced from 100% of that permissible. For example, in 2014/15 the charges were applied at a rate of 43%, generating €3M.

Fixed fee per herd (non-veal)	€26.00
Fixed fee per veal calf herd	€134.34
Fee per animal born	€0.27
Fee per animal over 1 year old	€2.56
Fee per animal purchased (under 1 year old)	€0.27
Fee per animal purchased (over 1 year old)	€3.90

**Table 2.** Schedule of charges applied to cattle owners by the Animal Health Fund to the bovine sector

In addition, a Dairy Fund has been in place since 1995. This collects €720,000 annually, derived from €0.13/1000L from producers and €0.11/1000L from buyers (annual milk production is approximately 3000M litres).

The Animal Health Funds are part of the state budget and subject to EU legislation relating to State Aid. Each fund has its own budget, resources, expenditure and financial reserves.

Ultimately, decisions on expenditure from the funds are taken by the Minister of Agriculture, based on input from the Council of the AHF for the bovine sector and dairy sectors, which in turn has a Working Group on IBR. The Working Group is supported by a technical working group (TWG).

THE IBR TWG is made up of various groups and organisations that have different roles within the eradication programme, including

- Veterinary authorities
- Veterinary practitioners

- Farmers' associations
- ARSIA and DGZ
- CODA-CERVA

The total spending on the IBR programme to date by the AHF has been €8,500,000, with the expenditure per year increasing with time as shown:

- 2007-2010- €200,000
- 2011- €500,000
- 2012-2015- €1,800,000. This comprises €300,000 to both ARSIA and DGZ for database management and a further €600,000 to each organisation. This covers the cost of one programme veterinarian per organisation, incentives to motivate farmers to progress to acquire and maintain an I-3 or I-4 status, the costs of additional analysis in case of aspecific reactions and communication and technical support.

The allocation of these funds by ARSIA and DGZ has varied over time. During the voluntary phase of the programme, the AHF was used to incentivize farmers to screen their herds. In 2012 this remained at 50% of the test cost, but currently in Wallonia is €1.90/animal where testing is carried out to acquire IBR-free status. Where testing is carried out to maintain a free status, a subsidy of €3.70/animal applies.

In addition to funding from AHF, other regional and provincial funds have also been provided to the programme.

Based on data presented, earlier uptake of serological screening rather than blanket vaccination in Wallonia saved farmers an average of €1,481 per herd between 2010 and 2013. This had a major impact in the costs of participation to the farmer in each region. In Flanders (15,350 herds, 1.2 million cattle) in the years 2010-2013 farmers spent €4.67M on serological testing (average €304 per herd) but €60.2M on vaccination (average €3921 per herd). In contrast, in Wallonia (10,201 herds, 1.2M cattle) more was spent on serology initially, totalling €7.4M in the same years (average €725 per herd). There was a saving on vaccination however, with only €20.6M spent in total (average €2019 per herd).

## F. Laboratory testing and data management

### National Reference Laboratory (NRL)

The NRL (CODA-CERVA) provides expert advice to the IBR programme through membership of the IBR Technical Working Group and carries out scientific research to maintain and expand this technical expertise. It also has a fundamental role in the management of the quality of the tests carried out by the recognised laboratories. This includes the following:

1. Authorisation of the commercial ELISA kits that can be used within the programme
2. Performance of quality control for each batch of approved kits,
3. Performance of mandatory proficiency tests for the recognised laboratories
4. Confirmatory testing of serological results by virus neutralisation test and the performance of virus isolation and PCR on samples collected following clinical suspicion of IBR.

The NRL does not perform the routine testing of samples for the IBR eradication programme, with this work carried out in recognised laboratories.

### Recognised laboratories

Recognised laboratories must:

1. Use only authorized kits and approved batches and be accredited to ISO 17025 for each kit they use.
2. Use the serum controls provided by the NRL.
3. Participate in proficiency testing organised by the NRL.
4. Store non-negative samples for 30 days.

Currently only two laboratories are recognised: DGZ for Flanders and ARSIA for Wallonia. Two main test methods are carried out: the IBR gB ELISA and the IBR gE ELISA. The gB test will detect antibodies generated following either vaccination or infection and therefore is used only in herds with I-4 status

and those seeking to acquire this status. Marker vaccines do not create gE antibodies while infection does. Therefore this test can be used to differentiate infected from vaccinated animals (DIVA). Therefore a gE-negative test result is consistent with an uninfected animal, irrespective of its vaccinal status. The IBR gE ELISA is used in I-2 and I-3 herds.

### Programme databases

ARSIA and DGZ maintain separate programme databases, each of which delivers similar functionality in terms of management of herd status, taking into account test results and vaccination, detection of non-compliances with the programme and communication with farmers and vets.

Differences exist in the degree of automation of the assigning and maintaining of herd statuses and in the recording of vaccinations. For I-3/I-4 status, a manual check of serological screening results is performed at ARSIA before the status is attributed and recorded manually in a specific software programme, whereas at DGZ 90% of herd statuses are attributed by an automated programme. In addition, ARSIA record vaccination details at individual animal level, whereas DGZ record this at herd level (see below under Vaccination for details).

Test results are reported to both farmers and vets. The programme databases also interact with the national SANITEL database, sharing identification and registration information and also herd statuses. Farmers, vets and traders have access to herd-level information on the databases of ARSIA and DGZ. Initially, farmers were asked to grant permission to share this data but the sharing of this information is now established in legislation.

The databases also generate lists of animals to test to maintain I-3 and I-4 status.

Currently, only serum samples are tested within the programme. Work is ongoing to evaluate whether milk will be used in the future. CODA-CERVA have evaluated tests for bulk tank milk samples as part of a broader study (IBRDIA). The underlying concern related to the fact that some test methods would give a negative result even when there were a variable

low percentage of positive animals contributing to the sample. The IBR gB and gE ELISAs, were found to give a negative result when the prevalence fell to 10% and 10-15% respectively. Another ELISA test format (Indirect ELISA; detecting antibodies to a range of viral proteins) was least affected, giving a positive result with a 2% prevalence of positive animals. One option that is available to address this is the use of concentration techniques, which have been shown to reduce these thresholds to 0.2% and 0.33% respectively. However, these concentration protocols are relatively costly to perform.

### Issues with testing

A key issue identified was the generation of “aspecific” positive test results, particularly in test-negative herds with I-3 and I-4 status, with the potential to cause herds to lose their status. Potential explanations include kit issues, cross-reactions with other herpesviruses (e.g. BoHV-2, BoHV-5, Caprine HV-1, Cervid HV-1) and previously unrecognised vaccination. The lack of confirmatory testing for the IBR gE ELISA makes it difficult to investigate the origin of these. The NRL conducts further investigation of samples generating aspecific results and have developed complex algorithms for further testing and interpretation of these results. Between 01/12/2006 and 01/11/2012, 1.4 % of all sera tested by gB ELISA triggered a confirmation procedure due to the result being considered aspecific. These samples came from 23.6% of all herd screenings. The parallel figures for the gE ELISA were 0.3% of samples and 7.1% of herd screenings.

There are no specific protocols for the management of seronegative latent carrier (SNLC) animals.

## G. Vaccination

Previously, vaccination against IBR was used to prevent clinical signs rather than for eradication. Vaccination was generally performed once a year, most commonly at housing. In the context of eradication, vaccination is limited to marker

(gE deleted vaccines) given twice per year. The rationale for vaccination twice per year (hyper-immunization) rather than just once is that the former reduces the level of shedding of virus in addition to protecting against clinical disease but also to prevent shedding from latent carriers. In the context of eradication, biosecurity is important to ensure that infected animals are not introduced to the herd.

Both live and dead IBR vaccines are available from several pharmaceutical companies. All of these vaccines, regardless of licensed indications, are used on a 6 monthly basis (referred to as hyperimmunisation) following initial vaccination (primovaccination) which may be a single or double dose depending on the brand and type of vaccine. The choice of vaccine brand and type is determined by the ES vet in conjunction with the herd owner. There were no concerns raised with regard to herds changing between vaccine brands.

For herds to acquire and maintain an I-2 status, all animals over 3 months of age and present in the herd for 35 days or more must receive a primovaccination consisting of either a single dose or two doses at a 21-35 day interval. Thereafter all animals must receive a booster dose within 8 months of the preceding one.

Therefore I-2 status is acquired or maintained if all animals older than 10 months of age are primovaccinated or hyper-immunised and all animal older than 17 months have been hyper-immunised.

### Decision to vaccinate

At the start of the programme, the decision for non-vaccinating herds of unknown status to either vaccinate or seek an I-4 status fell to the farmer and his veterinary practitioner. The use of the snap shot screen described earlier was encouraged, but many herds, particularly in Flanders, did not use this strategy, instead adopting a vaccination policy. In this way many herds that were free or had low prevalence of infection acquired an I-2 status, even though a proportion could have proceeded rapidly to an I-4 status.

## Supply, administration and recording of vaccine usage

Vaccines must be obtained via the ES Vet. Figures from ARSIA for Wallonia indicate that overall in 2013/14, 74 % of IBR vaccine doses were live, accounting for 91% of primo-vaccination and 69% of boosters. In terms of vaccine administration there are two options:

- 1) Administered by a veterinary practitioner.
- 2) Where the cattle owner has signed an agreement with a private veterinary practitioner to act as an ES vet, the programme allows the herd owner to administer the vaccine under their authorization and guidance. Practitioners raised concerns with this derogation in relation to the impact on the progress of the programme and their ability to certify the status of animals and herds which they had not personally vaccinated.

In Wallonia ARSIA estimate that approximately two thirds of herds were vaccinated by the ES vet, representing 52% of all vaccine doses used.

Records of vaccination should be reported to the relevant database (ARSIA or DGZ) within 7 days. At DGZ, this is recorded at herd level, with only the total number of doses administered and the type of vaccine used being recorded.

At ARSIA, records are maintained at animal, rather than herd, level. The record of the vaccination can be done by the vet, the owner or by ARSIA (with a fee being applied in this case), with details of vaccine type, route of administration and whether administered by the vet or the farmer being recorded. Before granting a continuation of I-2 status, checks are applied to ensure that the necessary animals have been vaccinated and that legal requirements have been complied with. Where the vet has given the vaccines, they certify the vaccination of individual animals. Where the farmer has given the vaccine, the vet signs only to confirm that they have supplied the vaccine. The database maintains a register of doses of vaccine purchased and used, and identifies any conflict between the two.

## H. Progress to date

### Voluntary phase

The level of engagement with the voluntary phase of the programme was limited until the approach of the compulsory phase of the programme in 2012. For example, in January 2011 only 300 herds in Flanders had attained an IBR-free status, while by January 2013 some 2,700 herds were IBR-free. There was also a marked increase in the volume of laboratory testing carried out in 2010 and 2011.

### Compulsory phase

Table 3 summarises progress to date, showing the number of herds with each status in Flanders and Wallonia. It is evident that greater progress has been made in Wallonia, with 51.3% of herds free as compared to 28.1% Flanders. This was considered to reflect, at least in part, a greater tendency to vaccinate in Flanders, whereas in Wallonia a more structured approach, using a serological snapshot, was taken to evaluate herd status and inform the decision on the most appropriate status to pursue.

The percentage of herds with I-3 status losing this due to positive test results during this period fell from 4% to approximately 1.5%, with the parallel figures for I-4 herds falling from approximately 2.2% to less than 1%.



Flanders	Herds		Cattle	
I-1	487	3.2%	3,084	0.3%
I-2	9,908	64.5%	850,668	71.7%
I-3	4,824	31.4%	326,858	27.6%
I-4	131	0.9%	5,651	0.5%
<b>Total</b>	<b>15,350</b>	<b>100%</b>	<b>1,186,261</b>	<b>100%</b>

Wallonia	Herds		Cattle	
I-1	306	3.0%	3891	0.3%
I-2	3,954	38.8%	591702	48.4%
I-3	5,052	49.5%	564298	46.2%
I-4	889	8.7%	61746	5.1%
<b>Total</b>	<b>10,201</b>	<b>100%</b>	<b>1221637</b>	<b>100%</b>

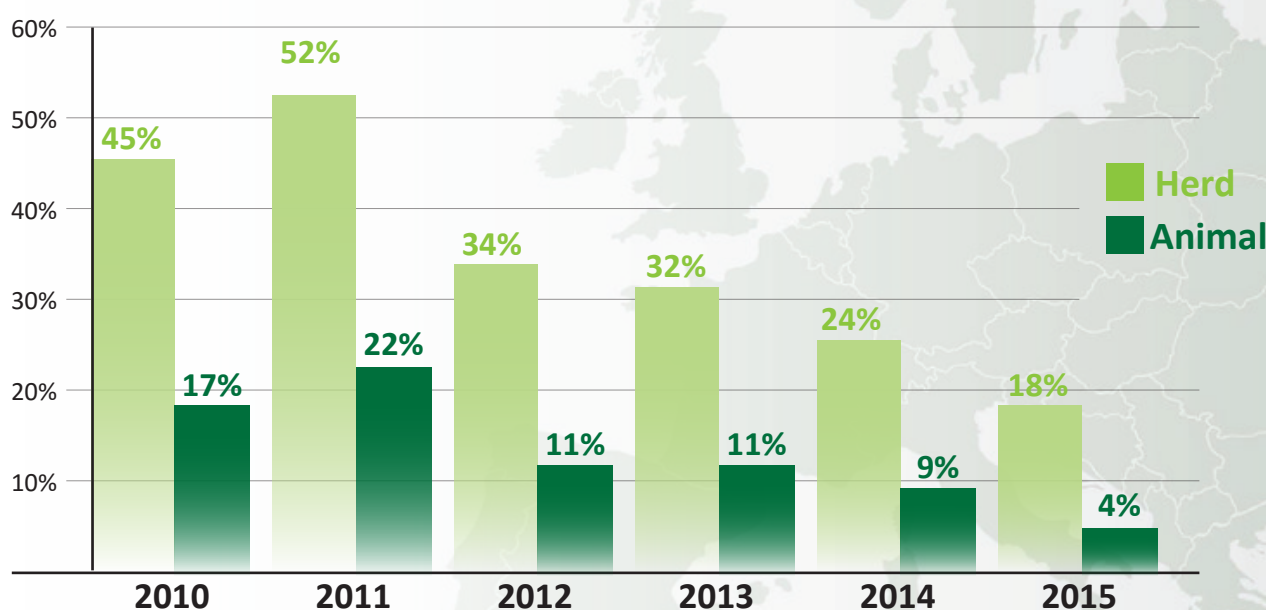
**Table 3.** Numbers (%) of herds in Flanders and Wallonia with statuses I-1-4 and the numbers (%) of cattle associated with these herds in September 2015.

### Winter screening

Each winter, CODA-CERVA conduct a government-funded national survey, stratified by province and herd type, to determine seroprevalence of a range of pathogens. From 2011 onward, IBR has been included (using the gE ELISA). This assumes a prevalence of 50% with a confidence of 95% and a precision of 5%. In 2011, 800 herds were sampled, with 450 herds tested in each subsequent year. 40 animals per herd are sampled (10 aged 6-12 months, 10 aged 12-24

months and 20 aged over 24 months. Herds with one or more positive results were deemed positive. The herd level prevalence has shown a year on year decrease between 2011 and 2015 from 52% to 18% (Figure 1), indicating that a proportion of vaccinating herds are actually free and could progress to I-3 status. Animal-level status during this period has also decreased from 22% to 4% (Figure 1).

The number of confirmed outbreaks of IBR during this period has been five or less each year.



**Figure 1.** Herd and animal-level seroprevalence based on winter screenings results.

## I. Future developments and goals

A roadmap for the programme to achieve eradication and Article 10 status has been proposed. Key elements of this include:

- a. **2015:** Increased communication to farmers with a current I-2 status highlighting the advantages of progressing to I-3 or I-4 status.
- b. **From Jan 1st, 2016:** - keeping animals in an I-1 herd will be forbidden.
- c. **From July 1st, 2016:** mandatory testing of a number of animals in every I-2 herd (to be performed annually thereafter). Currently herds with I-2 status must vaccinate but there are no requirements to perform any testing. It is a challenge to motivate these herds to test with a view to proceeding to a higher status (despite it being more expensive to maintain an I-2 status than an I-3 or I-4 status). This compulsory testing will therefore provide herd owners with a clear view of their true infection status and either the potential to progress to a higher status or the need to revisit current controls.
- d. **From Jan 1st, 2017:** recording of gE-positive animals in the SANITEL database.
- e. **From Jan 1st, 2018:** gE-positive animals will only be able to move to an abattoir or to a fattening farm (indoors) with a mandatory test before purchase for I-2 herds. In addition the derogation which currently allows vaccination to be performed by farmers will be removed. Farmers will only be allowed to purchase animals from herds of the same or higher status and animals from I-2 herds will not be allowed at markets or assembly centres.
- f. **From Jul 1st, 2018:** mandatory testing of all animals in I-2 herds followed by mandatory elimination of every gE-positive animal via the abattoir.
- g. **2020:** Article 10 Status

This roadmap is to be validated by industry, evaluated by the Scientific Committee and legislated as a new Royal Decree in 2016.

## J. Lessons learned

### Reflections of the Belgian team

- i. A five year voluntary phase provided an opportunity to road test elements of the programme but did not deliver significant progress in the number of herds becoming IBR-free. It was suggested that a voluntary period of one year would have achieved the same goal.
- ii. The use of a serological snap shot to categorise herds should have been used more extensively and potentially made compulsory to assign herds to a category.
- iii. Legislation could have been used to ensure biosecurity measures were applied, especially in IBR-vaccinating herds (I-2).
- iv. Legislation could have been used to prohibit grazing by cattle in non-participating herds.

## 5 THE NETHERLANDS

### A. Livestock sector

**THERE ARE** approximately 37,000 cattle farms in the Netherlands, including 17,260 dairy farms (2.876 million cattle, median of 90 cows, Table 4). 18% of dairy cows are continuously housed and a further 52% have limited pasture access<sup>18</sup>. Overall there are approximately 20,000 non-dairy farms (suckler, beef, veal, young stock, small-holders and others), including 3,315 suckler herds (22,214 cattle, median herd size 20). Dairy farms are on average larger and have greater number of animals than non-dairy enterprises. The total cattle population numbers approximately 4.5 million. Data presented during

the study visit indicated that 53.4% dairy, 33.2% of suckler herds and 44.3% of smallholder herds were closed in the preceding 12 months (defined as no introductions recorded).

While the number of herds has reduced markedly since 1997 (60,096 herds of which 33,228 were dairy), the size of the cattle population has remained relatively static (4.242M in 1997).

From 1992-1995 (preceding the start of their compulsory eradication programme), The Netherlands exported 164,000 breeding animals and imported 460,000 calves.

Number of Herds	Type of Herd	Total numbers of cattle	Median Herd size
17,260	Dairy	2.876M	90 cows
3,315	Suckler	0.220M	20 cows
857	Beef	0.060M	50 animals
1,944	Veal	1.035M	400 animals
1,889	Contract Rearer	0.127M	55 animals
11,060	Small/Hobby Farmer	0.068M	
642	Others (Traders)	0.100M	
<b>Total 36,967</b>		<b>4.5M</b>	

**Table 4.** Breakdown of the total current cattle numbers in The Netherlands by herd type. (Data for Ireland in 2015 indicate 61,281 suckler herds, 17,105 dairy herds, 28,419 beef herds and 9,518 “other” herds [total 116,323]).

## B. History of and drivers for IBR control

### History

IBR was introduced to the Netherlands in 1971 and subsequently spread extensively<sup>19</sup>. At the end of 1994 prevalence studies found that 84% of dairy herds were positive on bulk tank milk testing. Overall, 42% of cows were positive and in 40% of herds more than 50% of cows were positive, with prevalence increasing with age (12% of heifers, 62% of cows over four years of age). The prevalence of herds of other types with detectable antibodies was lower (78% in bull beef units, 55% in “other” herds [including sucklers] and 8% in veal units. At that time, it was not possible to differentiate between animals that had been infected and those that had been vaccinated with conventional vaccines. Marker vaccines first became available in September 1995, raising the possibility of an eradication programme that incorporated vaccination and testing.

A voluntary control programme was established in 1995. This allowed farms to qualify for an IBR-free certificate based on testing of individual blood samples, with freedom maintained by bulk tank milk testing (13 times per year) in dairy herds or by random blood tests (three times per year). By mid-1996, 300 farms had qualified for IBR-free certificates, rising to 5,000 herds by September 1997. In May 1998, a mandatory programme was introduced with the aim of freeing the national herd of wild type (non-vaccinal) virus and then applying for Article 9 status.

The design of the programme was based on an epidemiological and economic modelling study of three different options<sup>19</sup> (Table 5). Options were evaluated in terms of time to eradication, cost of eradication and time to cost recovery. Based on this work, a compulsory programme based on vaccination but with dispensation from vaccination in certain cases was selected. The goal was to gain Article 9 status (but not article 10, allowing vaccination to be retained for emergency use).

### Drivers for control

The drivers for eradication included:

- Scandinavian countries were free
- It was believed that Germany was moving to control IBR;
- The importance of exports of breeding cattle and semen and ova, both to other Member States and Third Countries
- Losses due to clinical and subclinical infections and outbreaks at AI stations. These were estimated at €24M in 1995, including €13M in milk production, €1.5M for sub-clinical infections and €9.5M due to outbreaks in AI stations
- Public perception of IBR-free animals as being healthier

Method of control	Period to eradication (yrs)	Cost (€)	Cost Recovery (yrs)
Voluntary control	n/a		
Mandatory vaccination of all herds	5.5	145M	11.5
Vaccination of all herds with dispensations	4.6	100M	7.8

**Table 5.** Options for control subjected to epidemiological and economic modelling, and outcomes.



## C. Programme description

The programme was designed in three phases:

- a. Reduction phase (reduce the degree of infection to a very low level)
- b. Eradication phase (remove the last infected animals)
- c. Monitoring phase (maintain the situation achieved at end of eradication phase).

(It should be noted that at the time of this programme being initiated there were no standard definitions of the testing regime required for these phases, with these not being introduced until 2004 [2004/558/EC]).

### Reduction phase

Subject to dispensation, from 1st January 1998 to 1st July 1998, all cattle older than 3 months had to be vaccinated and receive a booster dose 3-5 weeks later (unless they had already received a vaccine dose in the second half of 1997). Thereafter, all cattle aged 3 months or more had to be vaccinated at least once every 6 months (minimum interval 4 months). While an initial booster dose after 3-5 weeks was no longer mandatory, it continued to be recommended.

### Dispensations and statuses

Under certain conditions, as described below, herds could be granted partial or full dispensation from the requirement to vaccinate, with each herd given an IBR-control status on that basis. The option to withdraw dispensations was retained should prevalence in herds under a given dispensation not drop rapidly enough.

#### i. IBR-free status

To obtain this status, all cattle over 12 months of age were blood sampled unless there were cattle present aged 0-12 months that came from a non-certified herd, in which case all animals older than seven days had to be tested.

- a. If all are negative, the herd is given an IBR-free certificate.
  - b. If less than 10% are positive, the farmer has the option to cull the positive animals within 8 weeks. A negative bulk tank milk (dairy herd) or negative blood test results on a random test of three animals per housing or grazing group 4-8 weeks later allowed an IBR-free certificate to be awarded. Herds with this status could (continue to) use vaccines if they wished to do so.
  - c. If more than 10% of animals are positive the herd must start/continue vaccinating (**vaccinating status**).
- To maintain the IBR-free certificate
- a. dairy herds must test bulk milk at least 9 times per year at 4-weekly intervals. Other herds must collect and test blood samples from 3 animals from each sub-population aged 12 months and older for gE (spot test) twice per year (if no animals of this age group are present then animals aged 0-12 months had to be tested).
  - b. Added animals from non-free herds and cows that had aborted must be tested with negative results.
  - c. Suspect outbreaks must be notified and investigated with negative results.
  - d. Biosecurity measures
    - Maintain cattle at a minimum 3m distance from suspect cattle
    - Provide farm clothes to professional visitors
    - Clean clothing and equipment to be used by attendants coming in contact with cattle
    - Added animals: if not from a certified herd the status is suspended (**observation status**) until it has been tested. If the animal is from a beef channel herd, or an objector status, it had to be removed irrespective of the result, otherwise it only had to be removed if the test was positive. In addition, following the removal of a test-positive animal, the spread of virus had to be excluded by either bulk tank or spot testing, with a negative result required to withdraw the observation status.

## ii. Beef Channel status

This status was available to herds which do not include female cattle over one year of age (i.e. non-breeding beef herds, veal units), reflecting their higher turnover rate, the lower prevalence in this age group, and their disposal to slaughter, subject to the following conditions:

- a. Animals must move directly to slaughter
- b. Animals may not be grazed

## iii. Vaccinating/young cattle IBR-free status

This status was available to herds with female animals older than one year, allowing animals less than 24 months old not to be vaccinated. This dispensation reflects the low prevalence of infection in young stock and also a desire to maintain an adequate supply of seronegative breeding heifers for export.

- a. To acquire this status/dispensation
  - collect and test blood samples from 3 animals from each sub-population aged 12 months and older with negative gE results
  - if added animals in the age group 0-12 months then these animals must also be tested.
- b. To maintain this status/dispensation
  - Continue this testing regime twice per year (minimum interval 4 months)
  - No added animals except from IBR-free herd
  - Biosecurity measures as for IBR-free status

## iv. Objector Status

This status is available to farmers who, for reasons of principle, refuse to vaccinate. The following conditions accompany this status:

- a. All added animals must come from an IBR-certified free herd
- b. Animals over 30 days of age may only be disposed of directly to slaughter
- c. Animals under 31 days may only be disposed of to slaughter or to herds with Beef Channel status

- d. Annual blood or milk testing to determine the progress with control
- e. Must guarantee at least a 3m gap from other herds if grazed

## v. Vaccination status

This status was awarded to herds for which no dispensation has been obtained or which are in the investigation phase for obtaining a dispensation.

## D. Organisations and individuals involved; roles and responsibilities

- i. Dairy Product Board: represented the entire cattle industry and had the power to make regulations for the dairy sector. The Board was also able to impose levies which were used to fund a range of activities including product promotion and research. The Product Board took the lead in introducing all of the legislation for the IBR programme with the exception of that relating to marker vaccines. (Note that all Product Boards were disbanded on 1<sup>st</sup> January 2015 and have not yet been replaced).
- ii. Ministry for Agriculture, Nature Management and Fisheries (LNV). Responsible for legislation prohibiting non-marker vaccines.
- iii. Animal Health Service (GD Animal Health (GD)). GD is a limited liability company which, amongst other functions, is responsible for development of national certified animal health programmes, including IBR. It was responsible for the management of herd statuses and also has an extensive diagnostic laboratory capability. It had a range of functions in the reduction phase including:
  - Testing of blood and milk samples
  - Assessing requests for dispensations
  - Issuing dispensations and herd certificates
  - Inspecting compliance with conditions for dispensation
  - Tracing outbreaks
  - Overall programme administration and monitoring of progress
  - Provision of a helpdesk
- iv. PVP. The PVP is responsible for blood sampling and vaccination.
- v. The farmer. In conjunction with their PVP, farmers decide which status to pursue (vaccination or IBR-free/dispensation). The programme was designed to give the farmer responsibility for outcomes, including the importance of biosecurity measures.

## E. Costs and Funding

Government funding was used for initial modelling and prevalence studies, but thereafter farmers essentially paid for all costs: vaccination, sampling and testing, culling and certification. The only contribution was the cost of the initial screen.

## F. Laboratory testing and data management

### i. Antibody testing

In the original IBR control programme, which took place in the 1990s, GD was the only laboratory involved in the testing of samples.

All testing (blood and bulk tank milk) were carried out using the gE ELISA. It was recognised and accepted that the assay would generate both false negative results (Sensitivity [Se] < 100% [a Se of 86% is attributed by GD to the gE assay]) and, in the absence of a confirmatory test, some false positive results (Specificity [Sp] < 100%). This approach was considered to offer greater simplicity than the use of both gE and gB (or indirect) assays, even though the latter were considered to have a higher Se in non-vaccinated animals. It is also recognised that following infection an animal will take longer to generate detectable antibodies using a gE assay (potentially 3-5 weeks) than is the case with gB/indirect assays (around two weeks). However, their use is considered valid for a number of reasons.

Firstly, with a Se of 86%, the likelihood of getting a false negative result where only one positive sample is present in a set is 14%. However, the likelihood of getting false negative results where three or six truly positive samples are present is only 0.27% and 0.007% respectively. Therefore if a herd is falsely assigned a negative result after a herd test, it is likely to contain only a very low proportion of positive animals, and these are likely to be older animals which will be amongst the first to leave the herd.

Secondly, in herds where infection is spreading, an animal-level prevalence of 70% or greater is expected to be reached within four weeks. In such cases the likelihood of a negative result on blood or bulk milk is highly unlikely. On this basis also the testing of three animals per group e.g. for dispensation from vaccination of young animals is also justified. When testing individual milk samples, GD data indicates a Se, relative to the gB assay in blood, of 96%. When testing bulk tank milk, GD data also shows 100% Se for detection of samples with 20% or greater of the contributing cows individually positive and 95.5% Se when prevalence was between 10 and 20%. If a seroprevalence of 70% is reached within four weeks of an outbreak, then recently infected herds that were previously certified free will be quickly detected where bulk samples are being analysed every four weeks. The aim of this monitoring is therefore to quickly detect newly infected herds, preventing transmission to other herds.

(Note that in practice this is similar to the approach taken in monitoring herds in the Belgian programme, where the sample size for blood testing to maintain freedom is based on a design prevalence of 15%, although testing is only conducted once per year).

## ii. Virus testing

GD also conduct PCR testing on nasal swabs from suspected outbreaks using PCR (typically two swabs per outbreak). Assays detecting gE and gB are available, allowing vaccinal and field viruses to be distinguished.

## G. Vaccination

Only live marker vaccines were used. Routine vaccinations had to be administered by the intramuscular route. This was done to minimize the possibility of vaccine virus being shed after intranasal vaccination, either immediately or following re-activation. The intra-nasal route remains available for emergency vaccination in the face of an outbreak. All vaccines are prescribed and administered by PVPs. Vaccination programmes are designed by the PVP in conjunction with the herd owner. During the compulsory phase of the programme (and to date subsequently) there has not been a central registration of vaccination.

## H. Progress to date

### a. Compulsory programme

By 1999 25% of dairy herds and 18% of other herds were IBR-free, with a further 26% and 67% respectively having a within-herd prevalence of <10%.

During 1999 four herds initially reported deaths associated with IBR vaccination. PVPs were immediately instructed to stop vaccination. In the following weeks over 8,000 herds reported problems. Ultimately deaths in only 12 herds were attributed to vaccination, but given the number of reports, the programme was suspended and did not subsequently continue on a compulsory basis. It was later shown that the problem was caused by contamination of the live IBR vaccine with BVDV type II<sup>20</sup>.

Despite the withdrawal of the compulsory programme, many herds continued to participate voluntarily. By 2004 only 19% of participating dairy herds and 12% of other herd types had a prevalence of over 10%.

### b. Revised voluntary programmes

From 2006, GD has offered two programmes.

#### i. Voluntary IBR-free programme

1. Acquiring freedom. The point of entry to the programme for dairy herds is a single BTM test using the gE ELISA. If this is negative, the expectation is that the within herd prevalence is less than 10% and the farmer can elect to carry out individual animal testing (blood) of all animals over 12 months of age (starting point for non-dairy herds). If all negative, an IBR-free certificate is issued. Otherwise positive animals can be culled and if a further BTM sample collected one month later is negative, the herd is awarded an IBR-free certificate. (Herds with a positive BTM sample [more than 10% seropositive] must vaccinate, with the option of a young stock dispensation as allowed in the compulsory programme).



2. Maintaining freedom. BTM samples must be tested at least 9 times a year with negative results (the cost of this screening is €200/year). In non-dairy herds, 3 animals from each subgroup aged over 12 months must be tested twice a year (cost for testing a blood sample is €6.40). Blood tests are carried out on samples taken in slaughter houses. For non-dairy herds, abattoir bloods may be used if available, seeking to sample one animal every two months (6 per year). If animals are not being slaughtered the farmer must have 6 bled annually. In addition:
  - a. Clinical signs must be investigated (two nasal swabs per outbreak). Typically 200-400 swabs are tested each year of which 10-25% are positive by PCR (of which 90% originate from non-certified herds).
  - b. Abortions: serum samples are tested (performed automatically by GD on samples collected under Brucellosis regulations).
  - c. Post-purchase testing of cattle (GD issue a letter to farmers after movement)

- ii. Voluntary IBR monitoring programme. This programme is based on BTM testing only. Participating herds have a monthly BTM screen and have the same additional requirements as herds maintaining freedom in the Voluntary IBR-free programme, with the exception that post-purchase testing is voluntary.

Herds may progress from the monitoring to the free programme subject to the following conditions:

1. Minimum of 2 years of negative BTM samples.
2. Blood test all animals over 6 years of age and purchased animals of unknown status. If positives are found, these may be removed and an IBR-free status still attained if a BTM sample taken one month later is negative.

The largest dairy processor provides some financial support to herds taking part in the IBR programme as part of a broader support for sustainability measures.

At the end of 2014, 28% of dairy herds were certified IBR-free in this programme, a further 15% were IBR-monitoring and 57% (~10,000 herds) had an unknown status (although the underlying national prevalence in dairy herds based on BTM surveillance is estimated at ~20%). For non-dairy herds, 11% were certified IBR-free while 89% (17,228) have an unknown status. The breakdown rate for dairy herds in the IBR-free and monitoring programmes for 2014 was 0.5% and 2.5% respectively, with the purchase of unknown animals occurring more commonly, and in more herds, amongst those in the monitoring programme.

## I. Future development and goals

In 2013, consideration of a new national IBR eradication programme, possibly to run in parallel with a BVD eradication programme, began. A Steering Group of farmers, industry and government asked GD to do the preparatory work. Two variations from the previous programme under consideration are (1) an initial exclusion of smallholders from the requirement to vaccinate and (2) the use of abattoir surveillance (one to three blood samples per year) in suckler herds.

The drivers remain largely the same, with the additions of the need to reduce antibiotic use, consistent with “healthy products from healthy animals” and a general desire to match progress in other countries. The goal would be Article 9 status initially. It is anticipated that the programmes will again be funded by industry and farmers rather than government.

Regarding the design of the IBR programme, GD will again model a range of scenarios.

It is recognised that a number of important factors have changed since the 1990s. As already described under “Livestock sector” the industry itself has

changed, with a smaller number of larger farms. During this period the number of veal calf imports have increased.

The progress made under the voluntary IBR-free and –monitoring programmes that followed the previous national programme have resulted in a better epidemiological situation and greater awareness of the disease, biosecurity measures and means of control.

At a governmental level, agriculture is now overseen by the Ministry of Economic Affairs rather than the Ministry for Agriculture, Nature Management and Fisheries. This reflects a desire on the part of government to reduce legislation where possible. Government involvement will be required for an application for Article 9 status. It is recognised that legislation will be needed to enable an eradication programme, but the Product Boards who were able to do this on behalf of industry for the previous programme were abolished on 1st January 2015 and have not yet been replaced.

Also the testing requirements of the previous compulsory programme, and the voluntary IBR programmes that replaced them, differ from current EU requirements for Article 9 status as defined by 2004/558/EC. This is particularly so in relation to the maintenance of an IBR-free certificate through use of repeat BTM testing independent of herd size and the sampling of small numbers of animals in non-dairy herds. The requirements under the EU's new Animal Health legislation, may provide an opportunity to address this, through a greater focus on the outputs (certainty of freedom) of surveillance rather the inputs (surveillance method).

In support of a new programme GD has developed two herd-level stochastic simulation models for dairy and suckler herds to compare the epidemiological and economic consequences of several different control scenarios, including the current EU programme and the Dutch alternative to this programme (BTM testing in dairy herds and abattoir surveillance in suckler herds). When taking both factors (progress and costs) into account, the Dutch alternative ranks highest in both dairy and suckler herds, with an overall cost-benefit for both sectors relative to the

current situation, while noting that a profitable cost-benefit was not achieved when the model was applied to suckler herds only. The organisers have not yet communicated extensively with farmers regarding the possible the reintroduction of a compulsory IBR control scheme.

While no decisions have yet been taken, the goal remains to initiate a programme with progression to Article 9 status thereafter.

---

## J. Lessons learned- reflections of the Dutch team

---

1. Any proposed programme is based on improved animal health and herd performance rather than just the ability to export live animals.
2. National modelling and prevalence studies in advance of a programme provide a good indicator of the way forward and likely benefits.
3. The Dutch programmes have used simple testing methodology based around repeated testing of bulk tank milk samples. Test sensitivity is less important, with any perceived weaknesses address through frequent testing.
4. The main aim of monitoring is to detect any new outbreaks quickly and stop further spread.

# 6

## IRELAND

### Conclusions and recommendations of the IBR TWG

1. **A STUDY** on losses to Irish farmers due to IBR is currently underway and the outputs of this work will inform the benefits element of a cost:benefit analysis (CBA) for a national IBR eradication programme. The IBR TWG is currently developing options for an eradication programme. Costs of each of these options will be determined, informing the cost element of the CBA. In addition to the testing regimes for acquisition and maintenance of a free herd laid down by 2004/558/EC, further options should consider the use of a snap shot to determine herd status with a view to avoiding herds unnecessarily embarking on vaccination programmes, the sampling of limited numbers of animals for maintenance of free herd status (both used in Belgium) and the use of bulk tank milk and abattoir surveillance as used in the Dutch programme.
2. If a voluntary phase is to be included in a national programme, it should be of limited duration (no more than one year).
3. Both Belgian and Dutch farmers have taken ownership of addressing IBR. Their role in driving and supporting the IBR eradication and control programmes is one of the key factors in the success of the programmes in these countries.
4. Scenario and economic modelling should be used as part of the CBA of each eradication option. These should at minimum include the testing regime as defined by 2004/558/EC along with the approaches taken in Belgium and the Netherlands.
5. The impact of the new Animal Health Law on future IBR programmes, including the mechanism by which a country could apply for formal recognition of an eradication programme (or freedom), permitted testing and surveillance options and the continued availability of additional guarantees in relation to intra-community trade, should be clarified as quickly as possible, with consideration given to the use of output-based measures.

6. While both Belgium and the Netherlands recognise the need to control IBR as a disease, freedom to trade through obtaining Article 9 status is a major driver for both countries. Paradoxically they also recognise that Article 9 (or 10) statuses impose limitations in relation to importing stock. This is considered to be less of an issue for Ireland, given the limited number of imported animals, but also needs to be recognised, particularly in relation to trade with Northern Ireland.
7. While a formal decision on the implementation of a national programme in Ireland remains to be taken, planning and implementation of a number of measures should be considered at this stage.
  - a. Implementation of a national programme in Ireland will have as an initial objective the obtaining of Article 9 status. An application will have to provide information to address a series of points laid down in 64/432/EEC, including a system for notification of IBR outbreaks and providing data on the distribution of the disease. Consideration should be given to progressing both of these requirements, including undertaking additional surveys, if required, to determine prevalence. The winter screening programme conducted annually in Belgium provides a template for ongoing surveillance, but consideration should be given to using other matrices and sample types such as bulk tank milk.
  - b. The Central Veterinary Research Laboratory should be formally recognised as the National Reference Laboratory for IBR and resources and functions assigned, including approval of test methods, determination of the sensitivity and specificity of diagnostic tests for blood and milk (including bulk tank samples) and development and implementation of protocols to manage aspecific results.
  - c. Consideration should be given to development of a national database capable of recording herd vaccination details and managing herd statuses.
  - d. Given that the majority of live imports come from Northern Ireland, Animal Health and Welfare NI (AHWNI) should be encouraged to consider an IBR eradication programme in NI and the Department of Agriculture and Rural Development encouraged to prohibit the use of non-marker vaccines. Steps should also be taken to raise awareness of the legislative prohibition on the use of non-marker vaccines in Ireland.
  - e. In advance of any national programme, establish a pilot programme, based on the requirements of 2004/558/EC to allow herds that wish to do so to acquire a formal IBR-free status.



## APPENDIX 1: ITINERARY OF IBR STUDY VISIT

### PROGRAMME – 8<sup>TH</sup> SEPTEMBER 2015

#### **CODA-CERVA Office (Floor -1/Finance Tower) (Kruidtuinlaan 50, Brussels)**

10.00am	Introduction and Welcome <i>Dr Yves Van der Stede (Unit ERASURV-CODA-CERVA)</i>
10.15am	Aim of the IBR Study Tour <i>Dr Michael Gunn (AHI)</i>
10.30am	IBR in BE: Organization of Technical working groups and Legislation. <i>Dr Gerard Lamsens (Federal Public Services)</i>
11.00am	Epidemiological landscape of IBR in BE <i>Dr Marc Dispas (unit ERASURV - CODA-CERVA)</i>
11.30am	Available Diagnostic tools for IBR & Quality Control <i>Dr Miet De Baere (NRL-CODA-CERVA)</i>
12.00 noon	Lunch
1.30pm	Follow up of status of IBR and Vaccination efficacy in field (Flanders and Wallonia) <i>Dr Stefaan Ribbens (DGZ Vlaanderen)</i> <i>Dr Jean-Yves Houtain (ARSIA)</i>
2.30pm	Follow up of IBR cases and Article 9 status in BE by FASFC <i>Dr Géraldine Boseret (Federal Agency for Safety of Food Chain)</i>
3.00pm	BVDV Eradication Programme in Ireland? <i>Dr David Graham (AHI)</i>
4.00pm	ARSIA, DGZ, & CODA for BE Conclusion and Discussion <i>Dr Yves Van der Stede (Unit ERASURV-CODA-CERVA)</i>

## APPENDIX 1: ITINERARY OF IBR STUDY VISIT

### PROGRAMME – 9<sup>TH</sup> SEPTEMBER 2015

#### AWE OFFICES, CINEY

10.00am	Introduction and Welcome
10.15am	Presentation of the Irish delegation and Belgian participants
10.30am	Introduction to Arsia, description of Walloon farms and funding for the IBR Programme <i>Dr Marc Lomba, Department Director, ARSIA</i>
11.15am	IBR Programme. <i>Dr Christian Quinet, Manager of Serology, ARSIA</i>
11.45am	Status management. <i>Dr Jean-Yves Houtain, Manager of Health Administration, ARSIA</i>
1.00pm	Lunch
2.00pm	Veterinary Practitioners – their involvement and views. <i>Dr Dominique Bonnevie, Rural Veterinary Practitioner and Chairman of UPV (Professional Union of Veterinarians)</i>
2.30pm	Farmers' experience of the IBR programme
3.45pm	Round Table discussion
4.00pm	Depart Ciney for Deventer

## APPENDIX 1: ITINERARY OF IBR STUDY VISIT

### PROGRAMME - 10<sup>th</sup> SEPTEMBER 2015

#### GD ANIMAL HEALTH LABORATORIES, DEVENTER

9.00am	<p>Introduction</p> <ul style="list-style-type: none"> <li>• Introduction to AHI and GD Animal Health</li> <li>• GD and its position in the Dutch veterinary network <i>Paul Wever, GD Animal Health, Deventer</i></li> <li>• AHI and its position in the Irish veterinary network <i>David Graham, Deputy CEO, Animal Health Ireland</i></li> </ul>
9.30am	<p>Irish cattle Industry and plans for IBR-eradication <i>Michael Gunn, Chairman, IBR, Technical Working Group</i></p>
10.45am	<p>Dutch approach 1997/1998 <i>Paul Wever, GD Animal Health, Deventer</i></p>
11.30am	<p>Dutch approach at present</p> <ul style="list-style-type: none"> <li>• The Dutch cattle Industry at present <i>Gerdien van Schaik, GD Animal Health, Deventer</i></li> <li>• Diagnostic tools <i>Jet Mars, GD Animal Health, Deventer</i></li> <li>• Voluntary programme <i>Linda van Duijn, GD Animal Health, Deventer</i></li> </ul>
12.15 pm	Lunch
12.45pm	Tour of laboratory
1.15pm	<p>Dutch plans for the future</p> <ul style="list-style-type: none"> <li>• Preparing eradication <i>Paul Wever, GD Animal Health, Deventer</i></li> <li>• Economic evaluation optional approaches in dairy and beef herds <i>Gerdien van Schaik, GD Animal Health, Deventer</i></li> </ul>
2.00pm	Discussion
3.00pm	Farm visit- Henk Blankena, Dairy Farmer
4.00pm	Depart Farm for Schiphol Airport

## APPENDIX 2: DETAILS OF BELGIAN, DUTCH AND IRISH DELEGATES

### 1. BELGIAN DELEGATES ATTENDING BRIEFING SESSION IN CODA-CERVA BRUSSELS (DAY 1)

NAME	ORGANISATION
Marc Lomba	ARSIA- Regional Laboratory
Stefaan Ribbens	DGZ Vlaanderen Regional Laboratory
Gerard Lamsens	Federal Public Services-Health Food Chain Safety and Environment
Xavier Vanhuffel	Federal Agency for Safety of the Food Chain (Scientific Committee)
Luc Vanholme	Federal Agency for Safety of the Food Chain: Control Policy
Marc Dispas	Unit Erasurv (CODA-CERVA)
Jozef Hooyberghs	Federal Agency for Safety of the Food Chain: Control Policy
Kristine Ceulemans	Federal Public Services-Health Food Chain Safety and Environment
Koen Mintiens	Boerenbond – Farmer Organisation in Flanders
Jean-Yves Houtain	ARSIA – Regional Laboratory
Philippe Houdart	CEO- Federal Agency for Safety of the Food Chain: Control Policy
Miet De Baere	Unit Enzorem (NRL IBR – CODA-CERVA)
Brigitte Cay	Unit Enzorem (NRL IBR – CODA-CERVA)
Geraldine Boseret	Federal Agency for Safety of the Food Chain: Control Policy
Dominique Bonnevie	Union Professionnel Vétérinaire (UPV)
Marie Laurence Semaille	Fédération Wallonne de L'agriculture – Farmer Organisation Wallonia
Frank Koenen	Direction Interaction and Surveillance (CODA-CERVA)
Herman Deschuytere	Unit Epidemiology – DGZ Vlaanderen Regional Laboratory
Francois Heymans	Cabinet De Willy Borsus, Ministre Fédéral Des Indépendants, PME, Agriculture et Int. Soc.
Thierry Vandenberg	Direction Viral and Bacterial Diseases (CODA-CERVA)



## APPENDIX 2: DETAILS OF BELGIAN, DUTCH AND IRISH DELEGATES

### 2. BELGIAN DELEGATES ATTENDING BRIEFING SESSION IN AWE OFFICES, CINEY (DAY 2)

NAME	ORGANISATION
Dr Marc Lomba	Department Director, ARSIA
Dr Christian Quinet	Manager of Serology, ARSIA
Dr Jean-Yves Houtain	Manager of Health Administration, ARSIA
Dr Dominique Bonnevie	Rural Veterinary Practitioner and Chairman of UPV (Professional Union of Veterinary)
Dr Denis Lecomte	PVP, Administrator ARSIA, representative of UPV
Dr Roland Distexhe	Rural Veterinary practitioner, Vice-Chairman of ARSIA
Didier Delmotte	Farmer and Chairman of Fesass,
Mr Jean-Louis Elias	Farmer and Vice-Chairman of ARSIA,
Mr Jean Detiffe	Farmer and Chairman of ARSIA,
Eddy and Jonas Pussemier	Farmers
Mr Benoît Cassart	Farmer and Secretary of the Federation of Livestock Dealers
Dr Sébastien Vandeputte	Awé (Walloon Association of Livestock)
Marie-Laurence Semaille	FWA (Walloon Federation of Agriculture)

### 3. DUTCH DELEGATES ATTENDING BRIEFING SESSION IN GD ANIMAL HEALTH LABORATORIES (DAY 3)

NAME	ORGANISATION
Paul Wever	GD, Animal Health Laboratories
Gerdien van Schaik	GD, Animal Health Laboratories
Jet Mars	GD, Animal Health Laboratories
Linda van Duijn	GD, Animal Health Laboratories

## APPENDIX 2: DETAILS OF BELGIAN, DUTCH AND IRISH DELEGATES

### 4. AHI TWG AND AFFILIATED DELEGATION MEMBERS ON STUDY TOUR

NAME	PROFESSION	ORGANISATION/EMPLOYER
Dr David Graham	Programme Manager for IBR (Deputy CEO AHI)	Animal Health Ireland (AHI)
Dr Michael Gunn	Chairman of IBR Technical Working Group on IBR	Retired Director of DAFM Laboratory, Backweston
Donal Lynch	Veterinarian & IBR TWG Member	Private practice
Maria Guelbenzu	Researcher & IBR TWG Member	Veterinary Sciences Division AFBINI (Northern Ireland)
Mary Newman	Veterinarian & IBR TWG Member	National Veterinary Manager (Livestock) Zoetis
Dr Stephen Conroy	Manager, AI Centre & IBR TWG Member	Tully Bull Performance Centre, Kildare
Dr Ronan O'Neill	Researcher & IBR TWG Member	Virology Division, DAFM Laboratories, Backweston
Dr Elizabeth Lane	Superintending Veterinary Inspector & IBR TWG Member	Department of Agriculture, Food and the Marine (DAFM)
William Fitzgerald	Veterinarian & IBR TWG Member	Veterinary Research Officer, DAFM Regional Veterinary Laboratory
Tim Geraghty	Researcher & IBR TWG Member	Scottish Agricultural College, Aberdeen
Colin Mason	Researcher	Scottish Agricultural College, Dumfries
John Fagan	Veterinarian/Researcher	Veterinary Research Officer, DAFM Regional Veterinary Laboratory
Grainne Dwyer	Events Manager (Tour Organiser)	Animal Health Ireland (AHI)
Aidan Brennan	Dairy Journalist	Irish Farmers' Journal

## References

1. COUNCIL DIRECTIVE 2003/43/EC of 26 May 2003 amending Directive 88/407/EEC laying down the animal health requirements applicable to intra- Community trade in and imports of semen of domestic animals of the bovine species
2. COUNCIL DIRECTIVE of 26 June 1964 on animal health problems affecting intra-Community trade in bovine animals and swine (64/432/EEC)
3. COMMISSION DECISION of 15 July 2004 implementing Council Directive 64/432/EEC as regards additional guarantees for intra-Community trade in bovine animals relating to infectious bovine rhinotracheitis and the approval of the eradication programmes presented by certain Member States (notified under document number C(2004) 2104) (Text with EEA relevance) (2004/558/EC)
4. COMMISSION IMPLEMENTING DECISION (EU) 2015/250 of 13 February 2015 amending Annexes I and II to Decision 2004/558/EC as regards the infectious bovine rhinotracheitis-free status of the Federal States of Saxony, Saxony-Anhalt, Brandenburg, Berlin and Mecklenburg-Western Pomerania in Germany
5. <http://www.bordbia.ie/industry/farmers/pricetracking/cattle/pages/livecattleexports.aspx> (accessed 23.10.2015)
6. Proposal for a Regulation of the European Parliament and of the Council on transmissible animal diseases (Animal Health Law). <http://data.consilium.europa.eu/doc/document/ST-11557-2015-ADD-1/en/pdf> (accessed 03.11.2015).
7. Cowley DJB, Clegg T A, Doherty ML, More SJ: Aspects of bovine herpesvirus-1 infection in dairy and beef herds in the Republic of Ireland. *Acta Vet Scand* 2011, 53:40.
8. Sayers RG, Byrne N, Doherty EO, Arkins S: Prevalence of exposure to bovine viral diarrhoea virus (BVDV) and bovine herpesvirus-1 (BoHV-1) in Irish dairy herds. *Res Vet Sci* 2015, 1:1–10.
9. S.I. No. 528/2002 - Diseases of Animals Act 1966 (Control on Animal and Poultry Vaccines) Order 2002. <http://www.irishstatutebook.ie/eli/2002/si/528/made/en/print> (accessed 03.11.2015)
10. More SJ, McKenzie K, O'Flaherty J, Doherty ML, Cromie AR, Magan MJ: Setting priorities for non-regulatory animal health in Ireland: results from an expert Policy Delphi study and a farmer priority identification survey. *Prev Vet Med* 2010, 95:198–207.
11. <http://www.animalhealthireland.ie/page.php?id=33>
12. [http://www.animalhealthireland.ie/ckfinder/userfiles/files/20150526%20Strategy%20Document%202015%20V1\\_2%20FINAL.pdf](http://www.animalhealthireland.ie/ckfinder/userfiles/files/20150526%20Strategy%20Document%202015%20V1_2%20FINAL.pdf)
13. <http://www.agriculture.gov.ie/foodwise2025/> (accessed 03.11.2015)
14. Sarrazin S, Cay AB, Laureyns J, Dewulf (2014) A survey on biosecurity and management practices in selected Belgian cattle farms. *Prev Vet Med* 117 129–139
15. Ensoy C, Faes C, Welby S, Van der Stede Y, Aerts M: Exploring cattle movements in Belgium. *Prev Vet Med* 2014, 116:89–101.

16. Prevalence of bovine herpesvirus-1 in the Belgian cattle population (2000). Boelaert F, Biront P, Soumare B, Dispas MH, Vanopdenbosch E, Vermeersch JP, Raskin A, Dufey J, Berkvens D, Kerkhofs P. Preventive Veterinary Medicine, 45 285-295
17. COMMISSION IMPLEMENTING DECISION of 8 October 2014 amending Annexes I and II to Decision 2004/558/EC as regards the approval of a control programme for eradicating infectious bovine rhinotracheitis in Belgium and the infectious bovine rhinotracheitis-free status of the Federal State of Thuringia in Germany (notified under document C(2014) 7113) (Text with EEA relevance) (2014/703/EU)
18. Scientific report of EFSA prepared by the Animal Health and Animal Welfare Unit on the effects of farming systems on dairy cow welfare and disease. Annex to the EFSA Journal (2009) 1143, 1-7
19. Vonk Noordegraaf A, Buijtels JA, Dijkhuizen AA, Franken P, Stegeman JA, Verhoeff J: An epidemiological and economic simulation model to evaluate the spread and control of infectious bovine rhinotracheitis in The Netherlands. Prev Vet Med 1998, 36:219–38.
20. Barkema HW, Bartels CJ, van Wuijckhuise L, Hesselink JW, Holzhauer M, Weber MF, Franken P, Kock PA, Bruschke CJ, Zimmer GM. Outbreak of bovine virus diarrhea on Dutch dairy farms induced by a bovine herpesvirus 1 marker vaccine contaminated with bovine virus diarrhea virus type 2. Tijdschrift voor diergeneeskunde 2001, 126(6):158-65.







IBR STUREP15 20160428



Supported by the Golden Jubilee Trust