ANIMAL HEALTH IRELAND

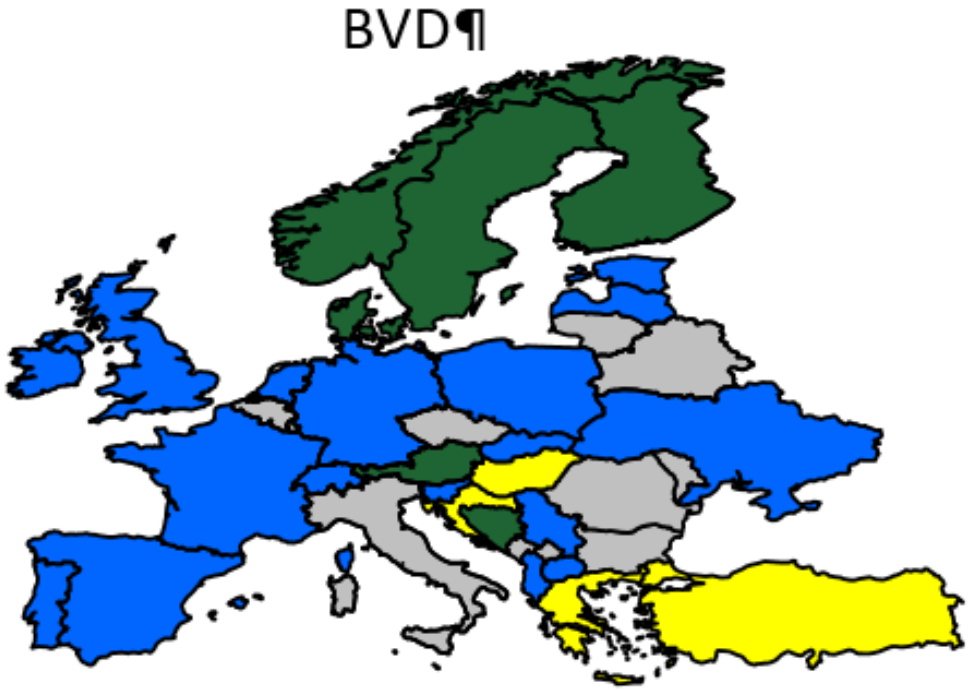
Contributing to a profitable and sustainable farming and agri-food sector through improved animal health

Control & Eradication of IBR and BVD in the EU: an overview

David Graham
CEO

CoVetLab workshop
Maisons-Alfort| 3rd FEBRUARY 2020

BVD eradication in Europe



SOUND control
COST Action CA17110

SOUND-CONTROL: WG1, Deliverable 1.1

Overview of non-regulated cattle diseases in the European Union for which control programmes (CPs) are in place within Member States (MS).

(This is an active document that will be updated on a regular basis)

Carla Correia-Gomes[1], Jaka Jakob Hodnik[2], Inge Santman-Berends[3], Sam Strain[4], Jörn Gethmann[5], George Gunn[1] on behalf of WG1 members (Ana Balseiro, Ann Lindberg, Anton Gerilovy, Celine Faverjon, Christine Fourichon, David Graham, Ebba Schwan, Elsa Duarte, Emmanuel Kalaitzakis, Erja Tuunainen, Gerdien van Schaik, Hans-Hermann Thulke, Petter Hopp, Igor Djadjovski, Ilias Chaligiannis, Iskra Cvetkovikj, Ivan Toplak, Ivana Davidov, Jacinto Gomes, Jasmeet Kaler, Jenny Frössling, Joao Niza Ribeiro, John Berezowski, Joze Staric, Kaspars Kovalenko, Kerli Mõtus, Lina Costa, Marc Dispas, Maria Guelbenzu, Marie Opsal Tangen, Matjaz Ocepek, Miroslaw Pawel Polak, Nada Knezevic, Ramon A. Juste, Selcuk Kaplan, Sinikka Pelkonen, Stefan Vilcek, Theofilos Papadopoulos, Tiina Autio, Xhelil Koleci)

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August 2019

1

cost
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Funded by the Horizon 2020 Framework Programme of the European Union

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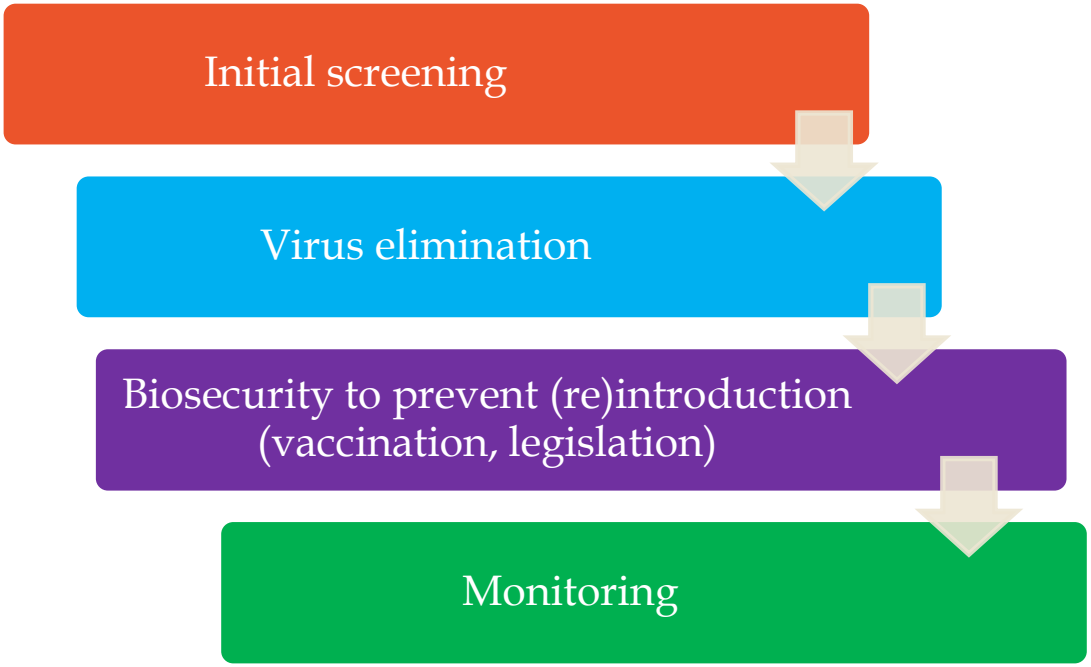
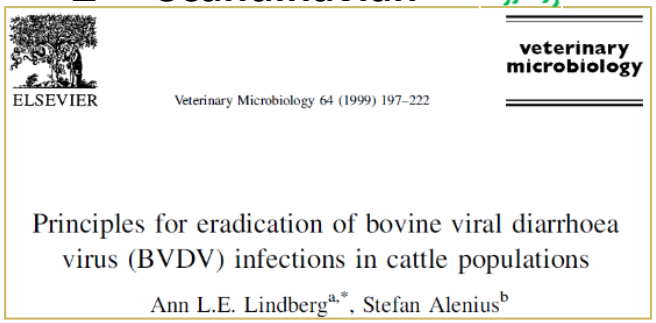
Europe- programme administration

Components of systematic control



Models of systematic control

Scandinavian


ELSEVIER

Veterinary Microbiology 64 (1999) 197–222

veterinary microbiology

Principles for eradication of bovine viral diarrhoea virus (BVDV) infections in cattle populations

Ann L.E. Lindberg[a,*], Stefan Alenius[b]

- Serological screen-herd level
  - Bulk tank milk
  - 1st lactation
  - Young stock check tests
  - Whole herd test if positive

Swiss


Veterinary Microbiology 142 (2010) 137–142

Contents lists available at ScienceDirect

Veterinary Microbiology

journal homepage: www.elsevier.com/locate/vetmic

ELSEVIER

BVD eradication in Switzerland—A new approach

P. Presi*, D. Heim

- RNA/Antigen- animal level
  - Tissue tag test for virus
  - Technology available
  - High seroprevalence
  - High herd density and level of contact

Europe- current situation

Scandinavian model

Swiss model

www.STOCfree.eu

Surveillance **T**ool for **O**utcome-based **C**omparison of **FREE**dom from infection

Aim of the project

Develop and validate a new tool:

that enables a **transparent and standardized comparison of confidence of freedom** for control and eradication programmes.

Development

Answering the question

When trading an animal: does it pose a risk of introducing a disease into the destination herd ?

p(freedom| information)

- **What is the probability and uncertainty that an animal is free of disease when leaving the farm given available information ?**

Progress

TABLE 1 | Comparison of BVD control programmes and BVD status in six European countries in 2017.

Elements	Countries					
	DE	**FR (Brittany)**	**IE**	**NL**	**SE**	**UK (Scotland)**
Herd level prevalence (breeding herds)	0.08%	unknown	2%	9%	0%–free	10%
Type of programme	Mandatory	Voluntary	Mandatory	Voluntary	Mandatory	Mandatory
Type of testing–screening/case finding	Ear notch, blood/serum	Bulk milk, ear notch, blood/serum	Ear notch	Bulk milk, ear notch, blood/serum	–	Ear notch, blood/serum
Type of testing - monitoring freedom of disease	Ear notch, blood/serum	Bulk milk, ear notch, blood/serum	Ear notch	Ear notch, blood/serum	Bulk milk, blood/serum	Blood/serum
Vaccines licensed for use	Yes	Yes	Yes	Yes	No	Yes
Funding	Private and public	Private	Private and public	Private	Private and public	Private
Most important herd level risk factors for introduction:						
1	Introduction of imported cattle	Boundary contact with neighboring cattle herds	Boundary contact with neighboring cattle herds	High cattle density	Introduction of imported cattle	Delayed removal of known PI animal(s)
2	Introduction of TI cattle	Introduction of cattle	Introduction of pregnant cattle	Introduction of pregnant cattle	–	Introduction of cattle with unknown status
3	Introduction of pregnant cattle	Presence of fattening unit	Indirect transmission through personnel	Indirect transmission through professional visitors	–	Boundary contact with neighboring cattle herds

DE, Germany; FR, France; IE, Ireland; NL, Netherlands; SE, Sweden; UK, United Kingdom.

STOC Free: An Innovative Framework to Compare Probability of Freedom From Infection in Heterogeneous Control Programmes

Annika M. van Roon[1], Inge M. G. A. Santman-Berends[1,2], David Graham[3], Simon J. More[4], Mirjam Nielen[1], Aurélien Madouasse[5], Mathilde Mercat[5], Christine Fourichon[5], Jörn Gethmann[6], Jenny Frössling[7], Ann Lindberg[7], Carla Correia-Gomes[8], George J. Gunn[8], Carola Sauter-Louis[6], Madeleine K. Henry[8], Linda van Duijn[2] and Gerdien van Schaik[1,2]*

frontiers in Veterinary Science

PERSPECTIVE
published: 26 April 2019
doi: 10.3389/fvets.2019.00133

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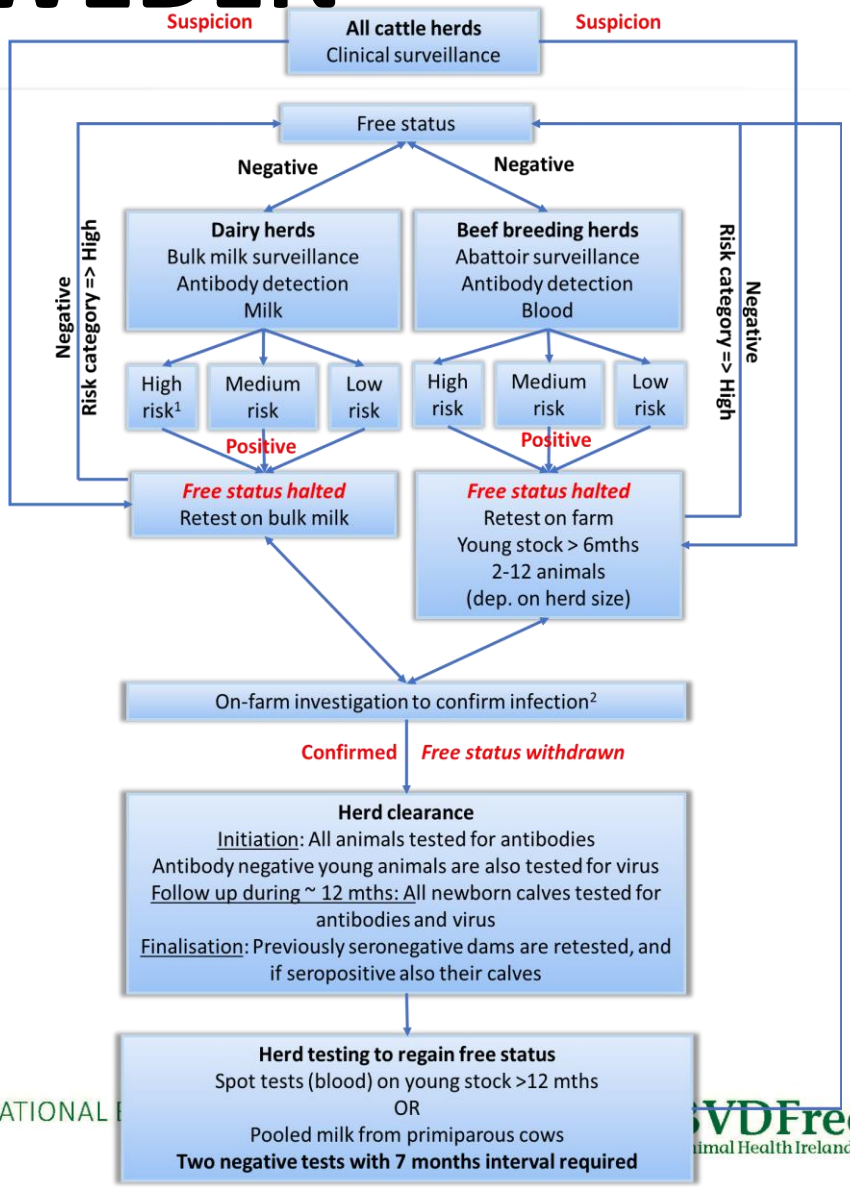
SWEDEN

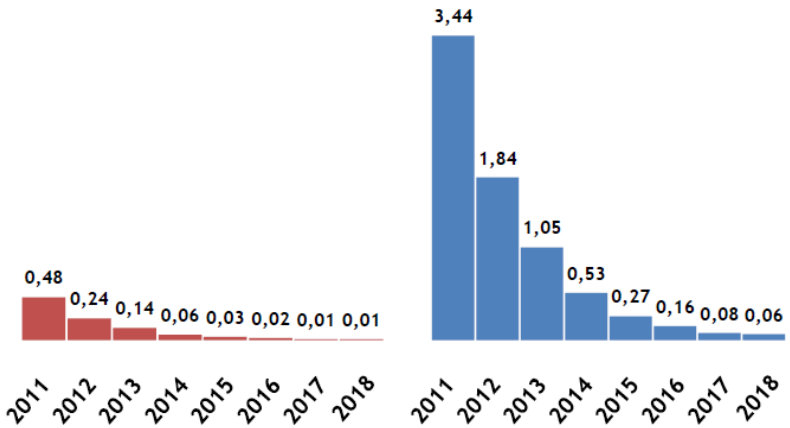
Journal of Dairy Science

A qualitative comparison of factors influencing confidence of freedom from bovine viral diarrhea virus infection in six European control programs

In press



GERMANY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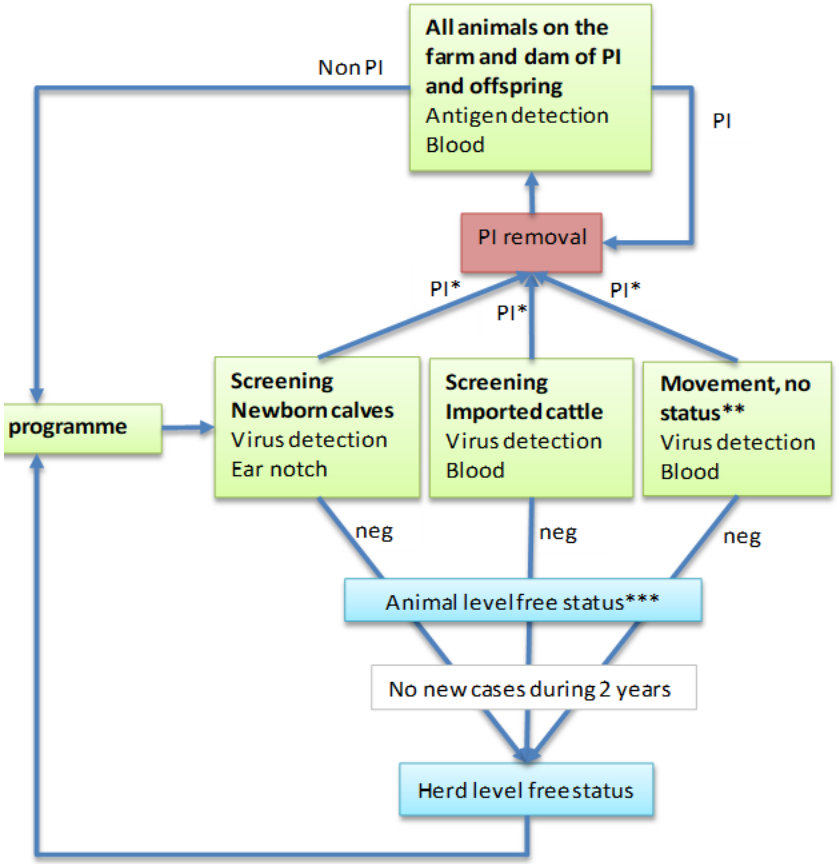
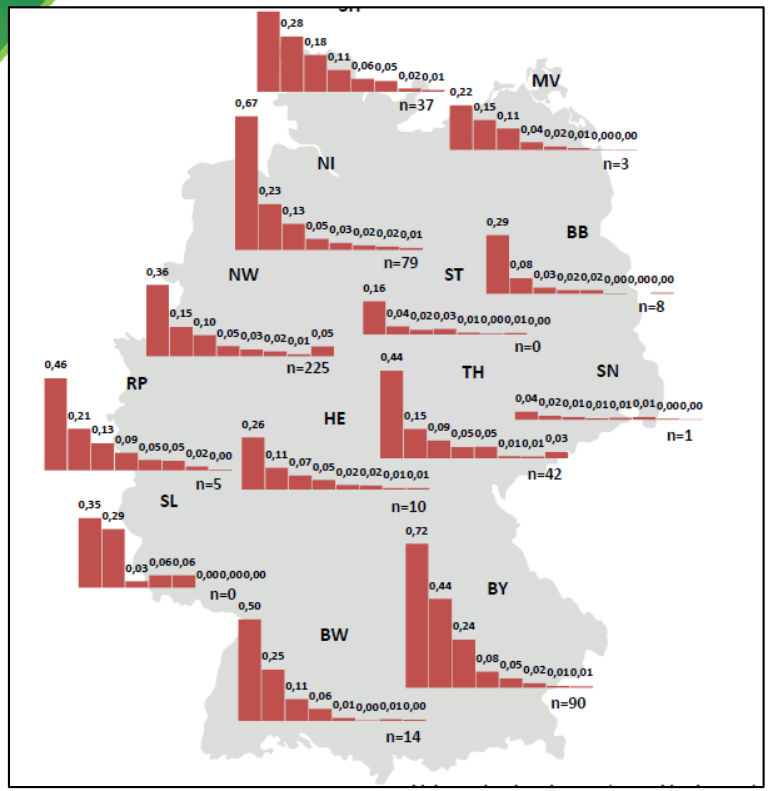
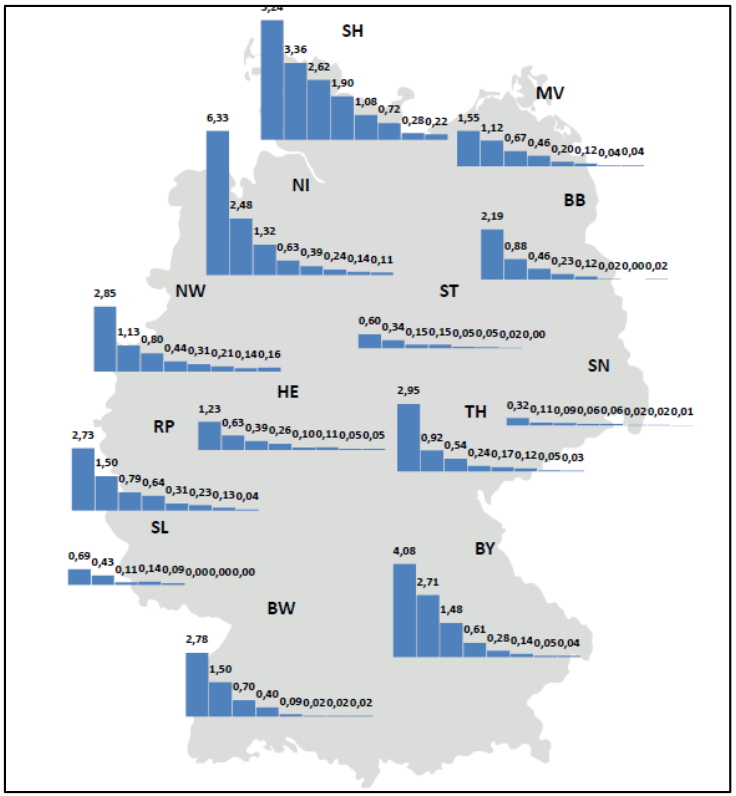

All animals on the farm and dam of PI and offspring
Antigen detection
Blood
Non PI
PI
PI removal
PI*
PI*
PI*
programme
Screening Newborn calves
Virus detection
Ear notch
Screening Imported cattle
Virus detection
Blood
Movement, no status**
Virus detection
Blood
neg
neg
neg
Animal level free status***
No new cases during 2 years
Herd level free status

Regional variation (2011-18)

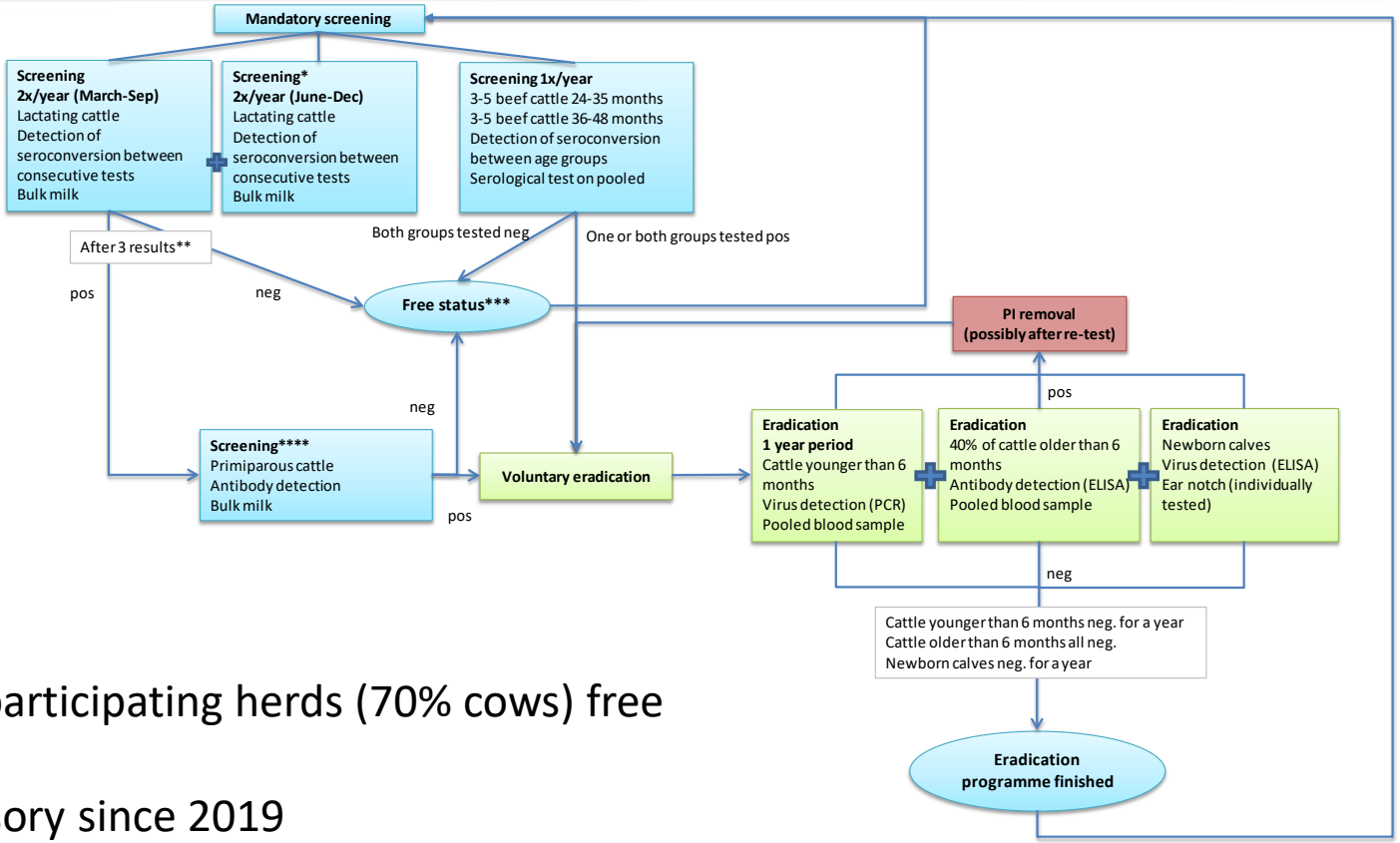


2011: 0.72- 0.04%
2018: 0.05- 0.00%



2011: 6.33- 0.32%
2018: 0.22- 0.00%

France (Brittany)



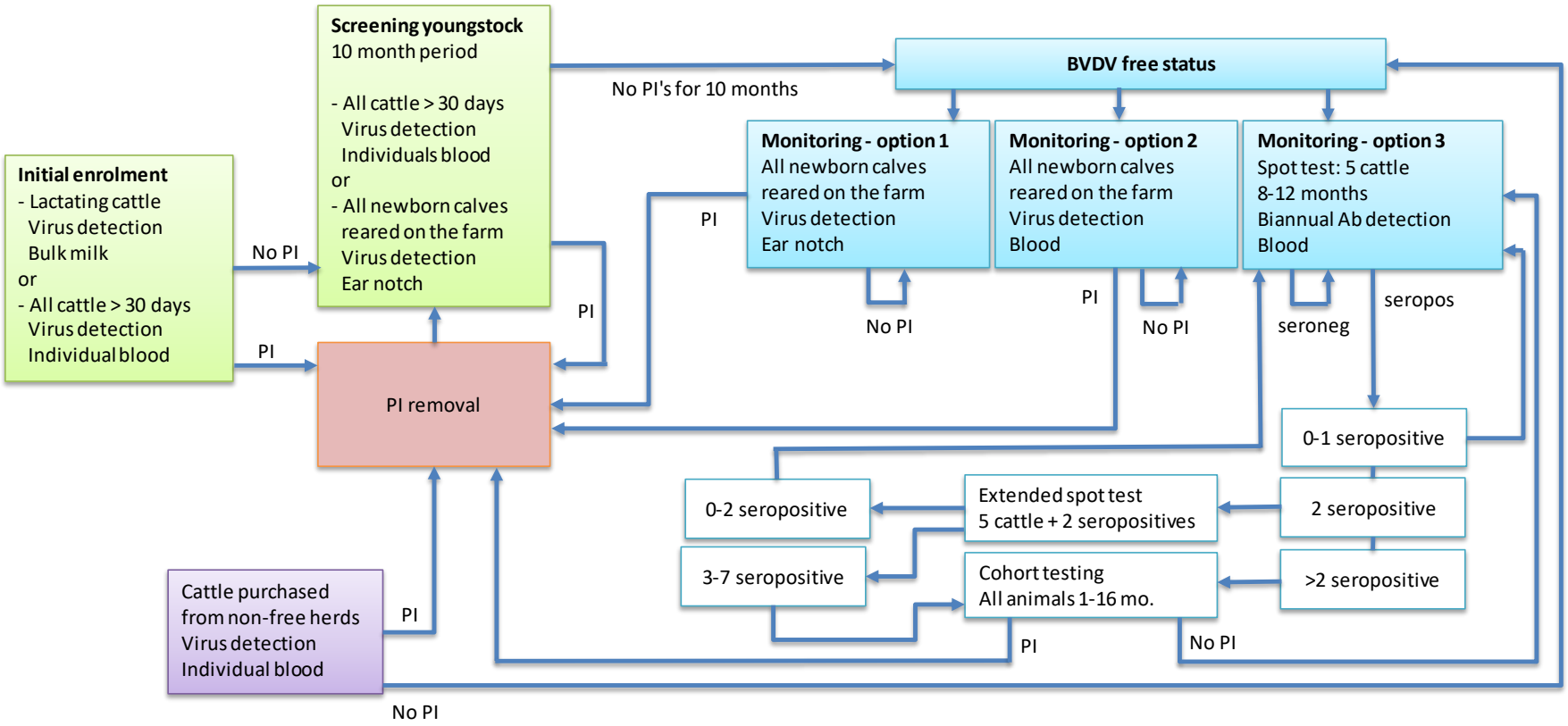
80% of participating herds (70% cows) free

Compulsory since 2019

Order of July 31, 2019 establishing surveillance and control measures against mucous membrane disease / bovine viral diarrhea (BVD)

NOR: AGRG1920523A
ELI: https://www.legifrance.gouv.fr/eli/arrete/2019/7/31/AGRG1920523A/jo/texte

THE NETHERLANDS



Compulsory control in dairy herds (voluntary in non-dairy herds)
73% (15%) herds free/unsuspected status

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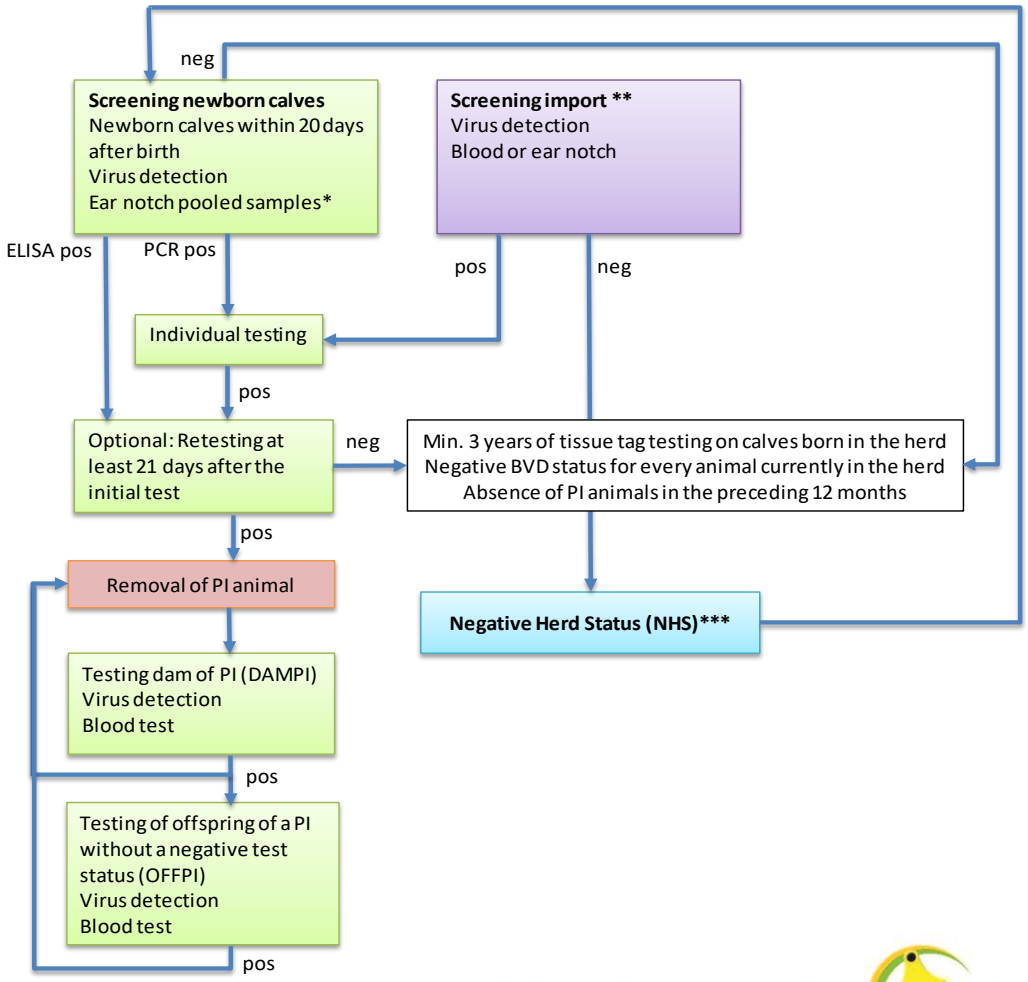
IRELAND



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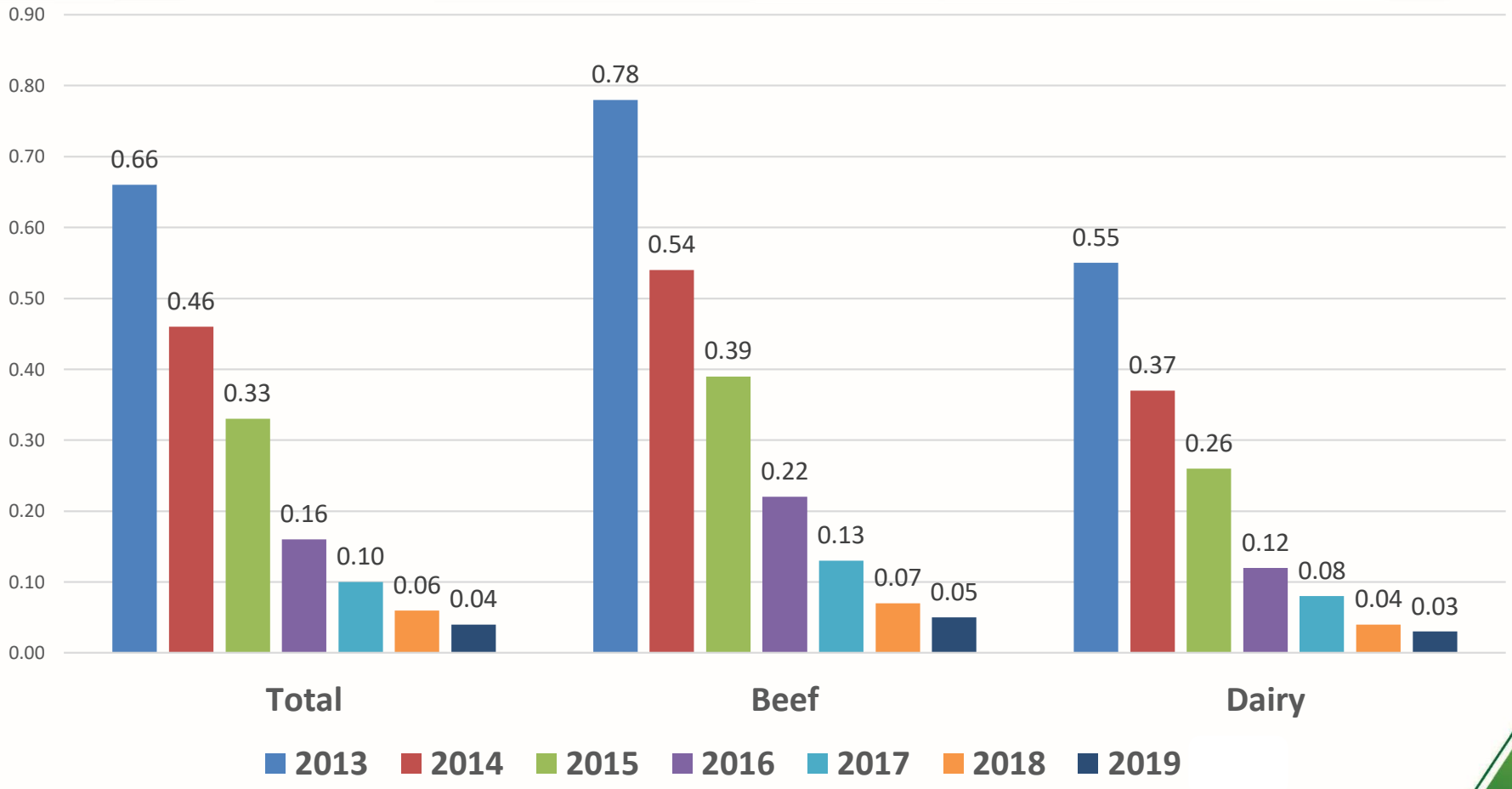
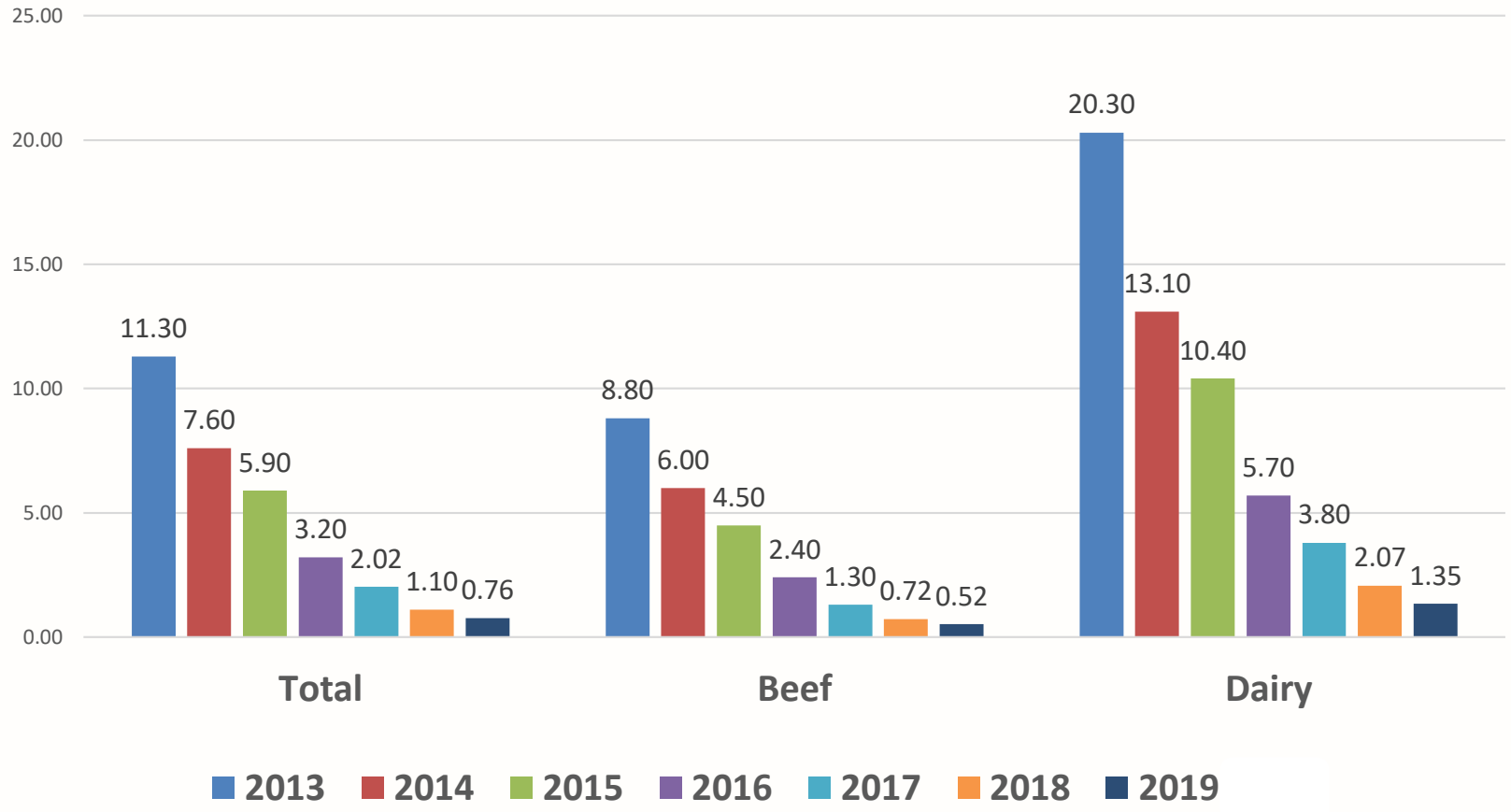
Animal (calf) prevalence



Herd (breeding) prevalence



Establishment Free from BVD Summary

No confirmed case of BVD last 18m

All animals tested for virus, including all calves in previous last 12 months

At least 3 serological screening tests :

50% seroprev with 95% confidence and at least 5 animals

Combination of the two

The capacity of the combined testing regime to detect the disease must be equivalent to that of the testing regimes referred to in points (i) and (ii);

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AND:

Introduced animals from:

- Free establishment in Free Member/zone OR
- Free establishment where testing regime applied 4 m (neg) OR tested neg prior to dispatch
- Tested negative for antigen or genome and quarantined 21 days prior and Pregnant dams: negative for antibodies on samples taken after not less than 21 days of quarantine OR have tested positive for antibodies against BVDV either prior to their dispatch or, in case of pregnant dams, before insemination preceding the current gestation.

Germinal products from free establishments or from approved germinal product establishments.

Maintenance of the Status- Testing

No confirmed case of BVD last 18 m

(i)Each new-born calf is tested for **BVDV antigen** or genome, no later than 20 days post-partum

(ii) At least annual **serological** screening tests (as 2nd regime)

50% seroprev with 95% confidence. ≥ 5 animals or all

(iii)Combination of the two

The capacity of the combined testing regime to detect the disease must be equivalent to that of the testing regimes referred to in points (i) and (ii);

(iv) if the establishment is located in a Member State or zone free from BVD, tests are carried out on samples taken in accordance with point 1(b) of Section 2 of Chapter 2 or point 3 of Section 2 of Chapter 2, if relevant.

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Chapter 2: Member State of zone free from BVD
Section 1 Granting of Status

The status free from BVD as regards kept bovine animals may only be granted to a Member State or a zone if:

(a) vaccination against BVD has been prohibited for kept bovine animals;

(b) no case of BVD has been confirmed in a kept bovine animal for at least the previous 18 months;

(c) at least 99.8% of the establishments representing at least 99.9% of the bovine population are free from BVD.

Annex III- Diagnostic methods
Section 6- BVD

1. Direct methods:

(a) Real-time reverse transcription PCR

(b) BVDV antigen detection ELISA

2. Serological tests:

(a) I-ELISA

(b) B-ELISA

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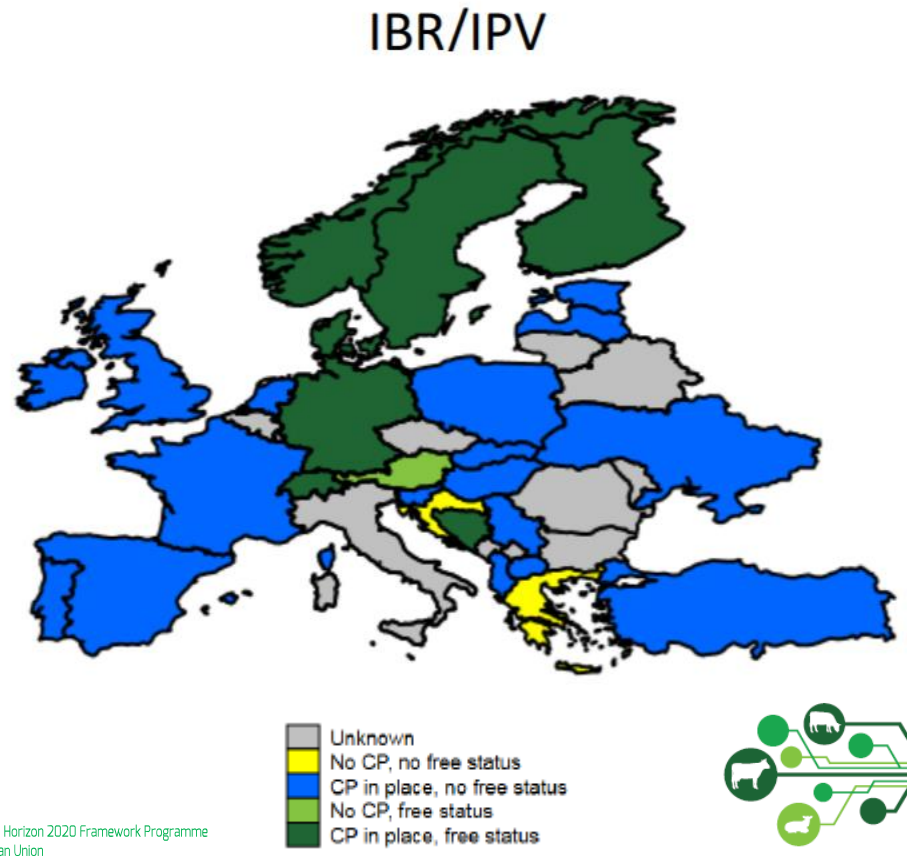
IBR eradication in Europe



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SOUND control
COST Action CA17110

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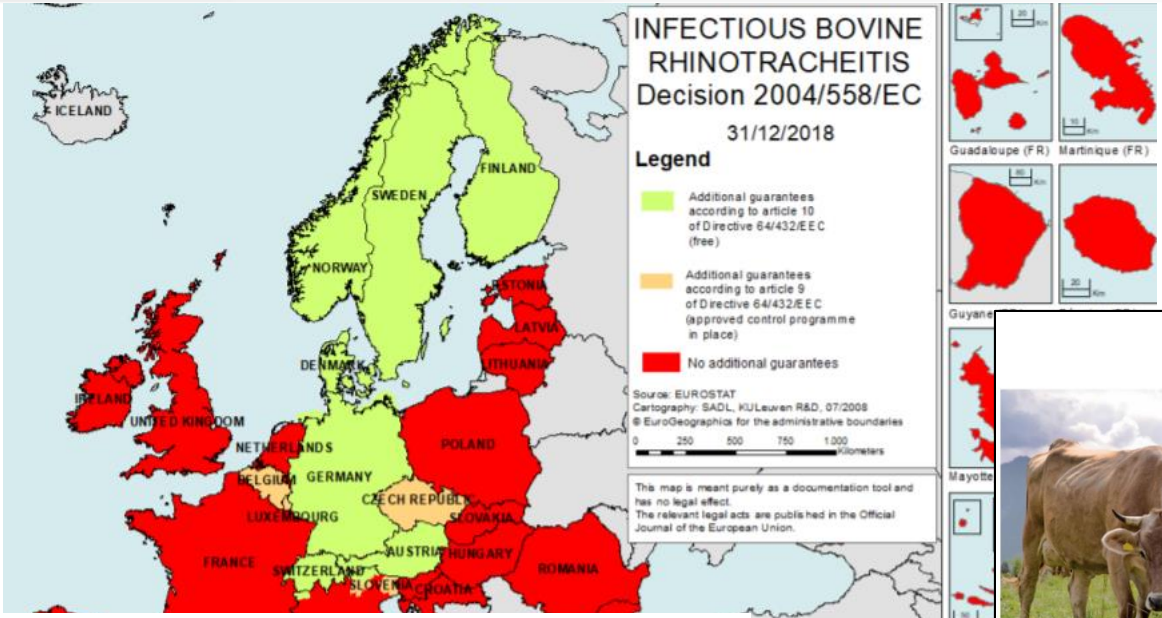
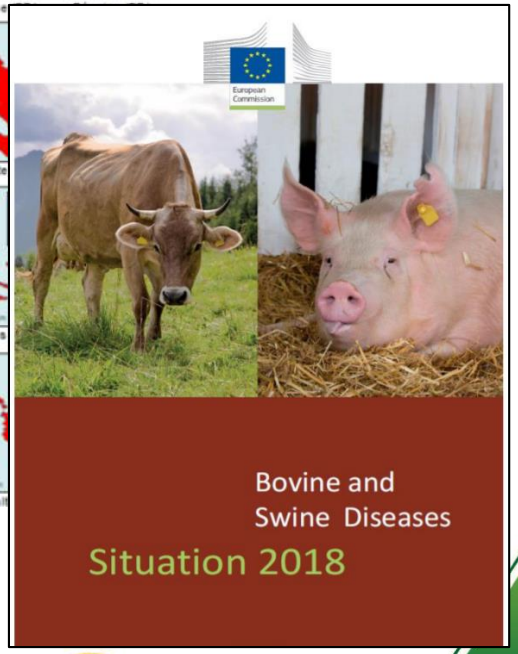
Commission Decision 2004/558/EC



Countries free (additional guarantees according to Article 10 of Directive 64/432/EEC)	
Austria	Norway
Denmark	Sweden
Finland	Switzerland
Germany	
Regions free (additional guarantees according to Article 10 of Directive 64/432/EEC)	
Italy	Autonomous Province of Bolzano and Region Valle d'Aosta
United Kingdom	Jersey
Countries with approved eradication programme (additional guarantees according to Article 9 of Directive 64/432/EEC)	
Belgium, Czech Republic and Luxembourg	
Regions with approved eradication programme (additional guarantees according to Article 9 of Directive 64/432/EEC)	
Italy	Region Friuli-Venezia Giulia and Autonomous Province of Trento



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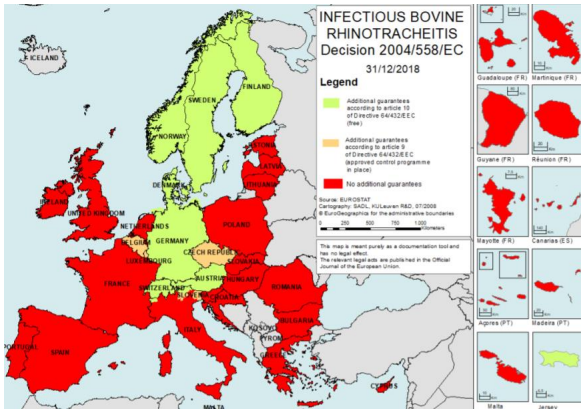
Testing/free herds

MS or region	Total number of existing bovine		Surveillance						Suspicion cases		Percentage of officially	
	Herds	Animals	Serological tests			Examination by bulk milk samples						
			Number of bovine herds tested	Number of animals tested	Number of infected herds	Number of bovine herds tested	Number of animals tested (if not available, indicate number of pools tested)	Number of infected herds	Number of animals tested	Number of infected animals	free herds	infected herds
AT	59519	1931616	1560	10884	0	1279	1284	0	923	0	100	0
BE*	25815	2453414	17530	772711	2	4	-	2	3	3	84,23	0,01
BG	56100	722653	19	108	17	0	0	0	108	51	99,97	0,03
CH*	34890	1543345	4893	17931	0	3052	3101	0	4132(1)	0	100	0
CZ*	20324	1419567	11831	648612	26	102	13900	0	0	0	99,8	0,13
DE*	125922(1)	11235123(1)	64453	3151362	47	47833	2904492	3	10821	809	99,79	0,21
DK*	17636	1522757	-	24776(1)	0	2946	n/a	0	0	0	100	0
FI*	-	-	369	1989	0	1325	1327(1)	0	195	0	100	0
IT*	10327	228619	2795	42274	13	4932	5366	3	358	0	99,68	0,32
LU	1172	192152	1172	81527	299	0	0	0	0	0	75	25
NL	33509	3945987	10777	-	217	4805	-	-	-	-	32	-
NO	13700	992000	1341	4153	0	1131	0	0	0	0	100	0
RO	417695	1723864	10133	22714	18	0	0	0	21	17	100	0
SE*	16317	1506637	3098	6625	0	2030	3290(1)	0	8(2)	0	100	0
SK	8676	445392	1876	77943	2803	0	0	0	1093	122	66	34
UK*	23550	1744432	2124	2931	644	178	188	134	417	6	n/a	n/a

Other countries



- NL- compulsory programme for dairy herds, voluntary non-dairy
- 75% (20%) IBR-free or IBR-unsuspected status.

Preventive Veterinary Medicine 139 (2017) 105–114

Contents lists available at ScienceDirect

Preventive Veterinary Medicine

journal homepage: www.elsevier.com/locate/prevetmed

Epidemiological performance and subsequent costs of different surveillance strategies to control bovine herpesvirus type 1 in dairy farms

Anouk Veldhuis[a,*], Inge Santman-Berends[a], Birgit Schauer[b,c], Jet Mars[a], Frederik Waldeck[a], Christoph Staubach[c], Gerdien van Schaik[a,d]

- France- compulsory programme

Order of May 31, 2016 setting prevention, surveillance and control measures against infectious bovine rhinotracheitis (IBR)

NOR: AGRG1614721A
Consolidated version as of January 18, 2020

Establishment Free from IBR/IPV Summary

- **N**o confirmed case of IBR/IPV last 12m
- No vaccination for at least 2 years + no
- Serological screening (gE/gB – vacc/unvacc):

1 x blood, milk or meat juice samples from:

- All bovine animals
- Over a period of not more than 12 months

2 bloods, milks or meat juice (2-12m) from:

- All females >12m
- All breeding males > 12m
- Random non-breeding males >12m (10% seroprev and 95% Conf)

Dairy ≥30% Lact

- 3 BTM (no less than 3 months) from all lactating females & all epi units
- 1 blood or meat juice from non-lacating females >12m + breeding males >12m
- Random non breeding >12m sample (10% seroprev and 95% Conf)

≥95% lact <5% males

BTM on at least 6 occasions at intervals of not less than 2 months from all lactating females representing all epi units

AND:

Introduced animals from:

- Free holdings + if from non-free zone/non approved programme, at least one whole/gE test after introduction OR
- Quarantine and test not earlier than 21 days after beginning

Germinal products from free holdings or approved germinal product establishments

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Section 2: Maintenance of the Status (2)

Requirements for establishment of IBR Free Status are fulfilled AND
Annual serological screening (gE/gB – vacc/unvacc):

- One blood, milk or meat juice sample from all >24 months old animals

Dairy ≥30% Lact

- BTM on at least 3 occasions at intervals of no less than 3m from all lactating females representing all epi units
- 1 blood from all breeding males >24 months old

≥95% lact <5% males

BTM on at least 6 occasions at intervals of not less than 2 months from all lactating females representing all epi units

IF Free Status maintained for past three **consecutive years**:

Annual blood or milk samples from a no of animals that allows for detection of at least 10% seroprev with 95% conf

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Chapter 2
Member State or zone free from IBR/IPV–
Section 1 Granting of Status

The status free from IBR/IPV as regards kept bovine animals may only be granted to a Member State or a zone if

(a) **vaccination** against IBR/IPV has been **prohibited** for kept bovine animals;

(b) **at least 99.8 % of the establishments representing at least 99.9% of the corresponding bovine population are free from IBR/IPV.**

Annex III - Diagnostic methods for the granting and maintenance of disease-free status for certain diseases of terrestrial animals

Section 4

	Methods:	Matrix:
non-vaccinated bovine animals	BoHV-1 I-ELISA[a]	individual serum samples[d]
		milk samples
	gB B-ELISA[b]	individual serum samples[d]
		individual meat juice samples
DIVA vaccinated bovine animals with a gE-deleted vaccine	gE B-ELISA[c]	individual serum samples
		individual meat juice samples

[a] I-ELISA for the detection of antibodies against BoHV-1 whole virus. Pools of up to 50 milk samples (individual or bulk milk) may be used in tests for granting and up to 100 milk samples (individual or bulk milk) may be used in tests for the maintenance of the status free from IBR/IPV.

[b] B-ELISA for the detection of antibodies against BoHV-1-gB protein. When referred to tests for the detection of antibodies against whole BoHV-1 in Part IV of Annex IV this method may also be used.

[c] B-ELISA for the detection of antibodies against BoHV-1-gE protein. Individual milk samples may be used when testing to proof the maintenance of the status free from IBR/IPV. The samples may be pooled whereat the number of samples per pool may be chosen based on documented evidence that the test is under all circumstances of day to day laboratory work sensitive enough to detect one single positive sample in the pool.

[d] When testing is carried out to proof the maintenance of the status free from IBR/IPV individually collected samples may be pooled. The number of samples per pool may be modulated based on documented evidence that the test system is under all circumstances of day to day laboratory work sensitive enough to detect one weak positive sample in the pool of the modulated size.

Acknowledgements

- Annika van Roon, Inge Berends-Santman (STOC Free)