

Contagious animal diseases

What are we defending and why?

Til seminaret:

“Fortsatt god dyrehelse i Norge”

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Contagious diseases

A subset of infectious diseases that are easily transmitted by physical contact, or by secretions or objects.



Rinderpest outbreak in
South-Africa, 1896

Physical contact



Various body-secretions

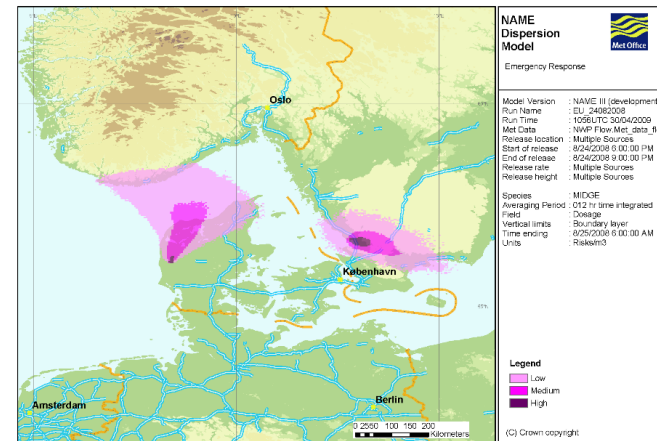
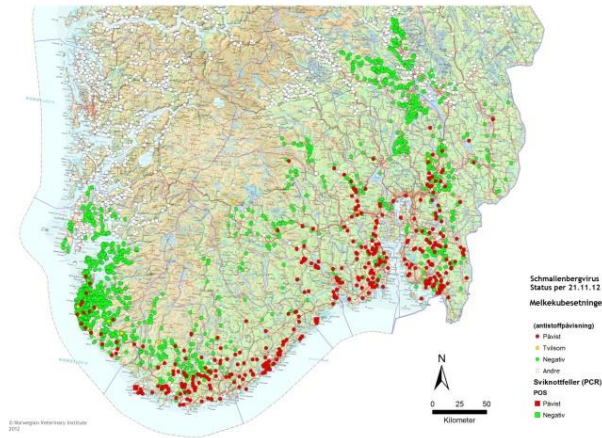


Contaminated
objects included
humans and feed



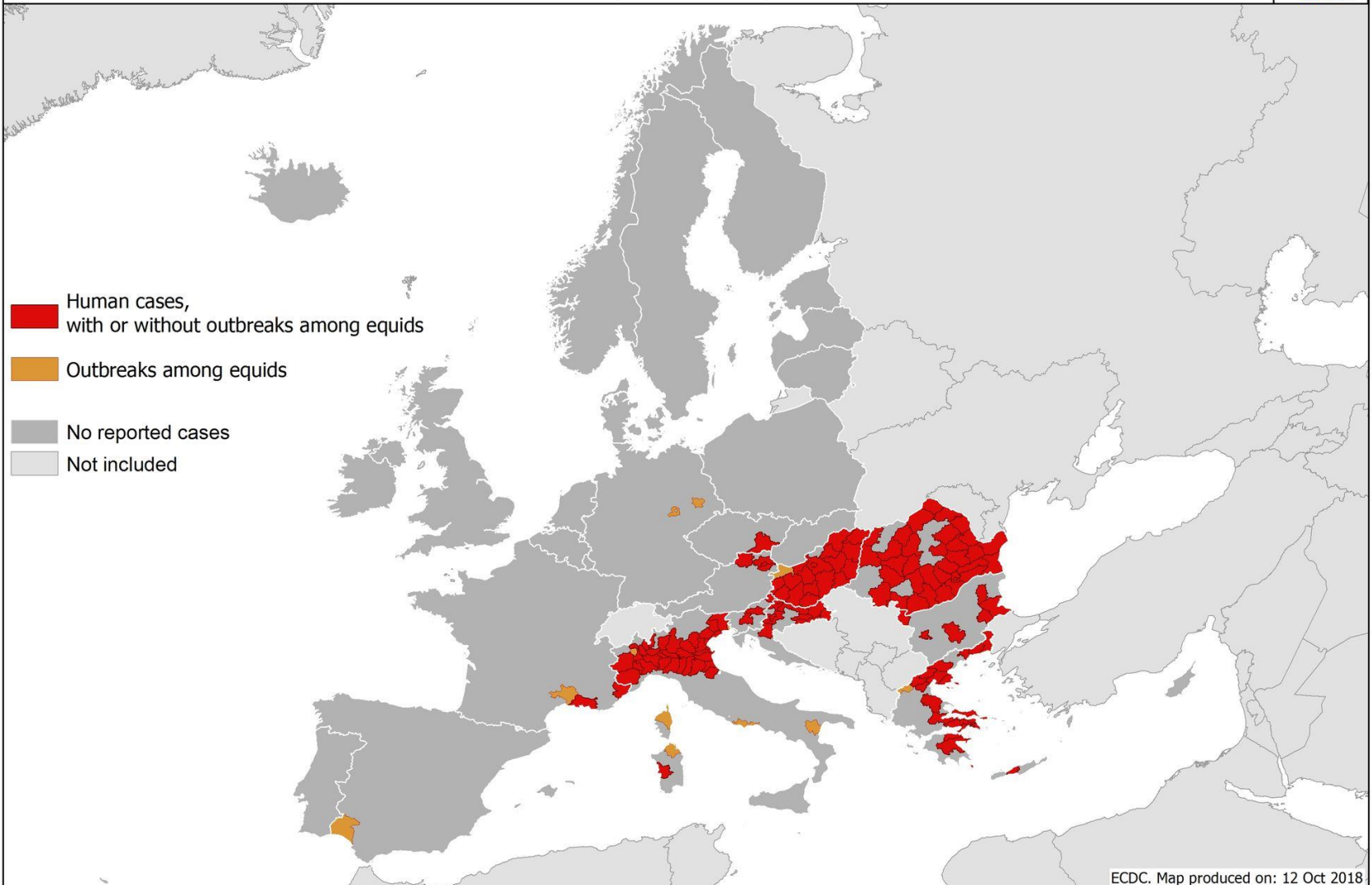
...and focus on VECTOR-BORNE diseases

- ✓ Vector-borne diseases are not included in contagious diseases, but we also need to have focus on them because vector-borne viruses are challenging Europe
- ✓ We fear vector-borne diseases more and more because of globalization, climate change and overgrowing of our landscape
- ✓ Large potential for spread
- ✓ They do not respect borders or zones
- ✓ Bluetongue- and Schmallenberg virus infected midges blew into Norway and Sweden 10 years ago

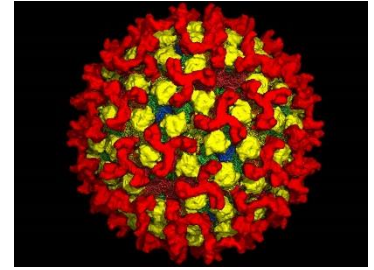


West Nile virus is emerging in Europe and has reached Berlin!

Distribution of West Nile virus infections among humans and outbreaks among equids in the EU
Transmission season 2018; latest data update 11 Oct 2018



Focus on:



Notifiable diseases listed as
“A” or “B” in the
Norwegian Food Law (++)



Leads to restrictions by
the Food Safety Authority



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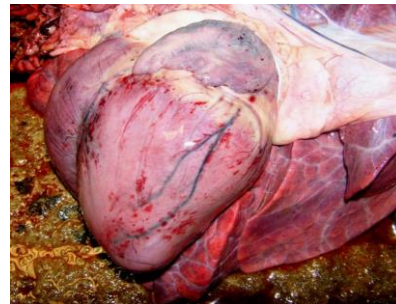
.....comparable to diseases
notifiable to the OIE

List A diseases

Very serious epizootic diseases and zoonoses



← Foot- and mouth disease



← Classical- and African swine fever



← Avian influenza

Brucellosis

List A pathogens:



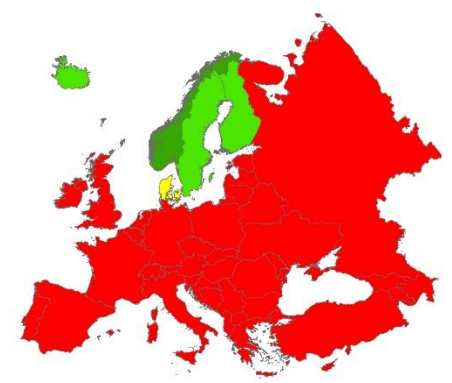
- ✓ ..cause disease in many animals in the same herd/flock
- ✓ ..potential to cause national and regional epizooties
- ✓ ..challenge animal welfare
- ✓ ...potential to have a large economical impact on the livestock industry, public health and the society in general
- ✓ ..a mandatory and detailed legislation in the EU that must be followed



FMD in the UK in 2001:

2050 holdings affected, 600 000 cattle, 3.2 mill sheep, 150 000 pigs og 1300 other animals culled and burnt

Status for the list A diseases



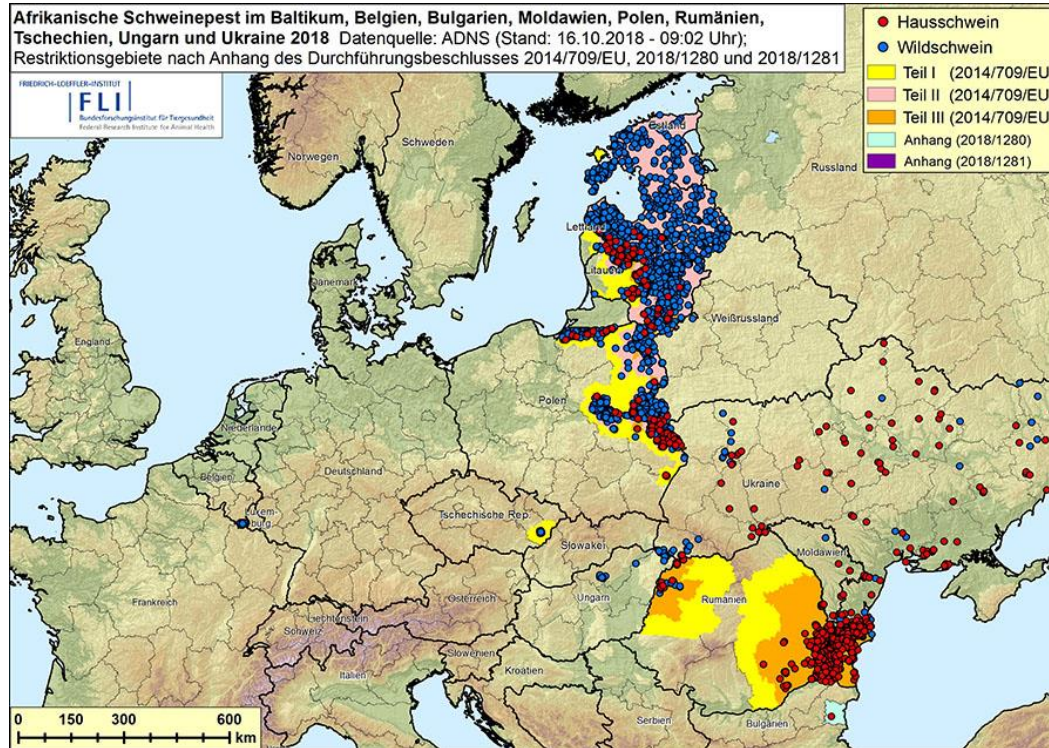
- ✓ A very favourable status in Norway, Sweden, Finland and Iceland compared to many countries in the EU

- ✓ Epizooties in the EU area after 2000:
 - ❖ Bovine spongiform encephalopathy (BSE)
 - ❖ Foot- and mouth disease (FMD)
 - ❖ Avian influenza (AI)
 - ❖ Bluetongue (BT)
 - ❖ Classical- and African swine fever (ASF)

With the exception of bluetongue, which was detected in 4 cattle herds in 2009, Norway has **not** been affected by the recent epizooties in terrestrial animals.



Is it possible to stop the African swine fever epizooty in Europe?



Today, African swine fever threatens the swine- and wild boar populations in the whole of Europe, including the Nordic countries. Nobody knows when and where this very serious epizooty will stop or if it is possible to stop it. The map from the Friedrich Loeffler Institute also shows big differences between countries in reporting diseases. The wild boars do not respect borders, but it could seem like they do, if we look at the border districts between Lithuania-Poland and the Belarus.

The list B diseases

Serious diseases for affected herds and flocks



← Paratuberculosis



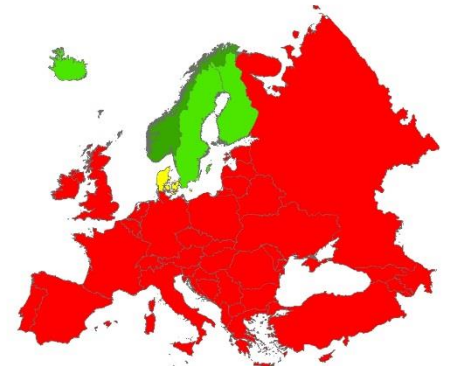
← Footrot



← Porcine reproductive and respiratory syndrome (PRRS)

- ✓ Paratuberculosis in ruminants, Footrot in sheep and Ringworm in cattle are examples of infections listed as group B. All three have been detected in Norway and thanks to coordinated efforts over years by the Norwegian authorities, a unified Livestock industry and the Scientific institutions have been brought to the brink of extinction with significant benefits to animal health, welfare and economics.
- ✓ The swine disease PRRS that was introduced to Sweden 10 years ago, but quickly eradicated in a very impressive way, is an example of a swine disease in this group, widespread in Europe, but not existing in Norway, Sweden or Finland.

Status for the list B diseases

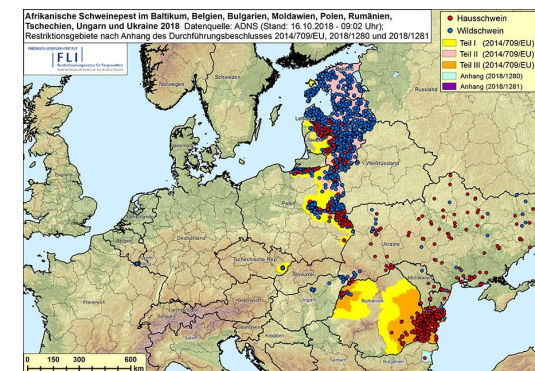


- ✓ A very favourable status compared to many countries in the EU
- ✓ List B diseases after the year 2000:
 - ❖ Classical scrapie (2009) very low prevalence
 - ❖ Footrot a few cases every year in Rogaland
 - ❖ Paratuberculosis (2015) very low prevalence
 - ❖ Maedi (2005) very low prevalence
 - ❖ Porcine respiratory coronavirus (PRCV) (2018) outbreak in Rogaland
 - ❖ Infectious bronchitis (2018) prevalent in “hobby flocks”

- ✓ Also for the B-listed diseases, the status in Norway, Sweden, Finland and Iceland, is very favourable compared to the situation in most European countries. Only a few of the diseases listed by the OIE have been found in Norway during the last 20 years, most of them with a very low prevalence.
- ✓ Several diseases on the list B have no legal basis in the EU-legislation and several of these are not notifiable in other European countries, often because they are endemic and widespread.

Emerging swine diseases!

- ✓ PRCV: The first introduction of a swine specific virus in 40 years
- ✓ PRCV is a very contagious virus, but no clinical symptoms was observed. Detection of such pathogens early in an outbreak is very demanding.
- ✓ PRCV is prevalent in Sweden and all over Europe. But how was PRCV introduced when we don't import live animals?
- ✓ African Swine Fever: How could it jump 900 km to the wild boars in Belgium?
- ✓ How was Chronic Wasting Disease introduced to the Norwegian reindeer population?



We think that nobody can answer these questions with certainty at the moment.

- ✓ In the following, we will, for 6 important contagious cattle-, small ruminant-, swine and poultry diseases, respectively, try to visualize differences and similarities between Norway and 5 EU countries; Sweden, Denmark, the Netherlands, UK and France. For cattle, we have selected Bovine tuberculosis, Paratuberculosis, Bovine virus diarrhoea, Infectious rhinotracheitis, Salmonella and *Mycoplasma bovis*. Green indicates freedom or very low occurrence, yellow low occurrence, brown medium and red high occurrence.
- ✓ We want you to look at the color gradients. The nuances of the colors may be debatable for some of the diseases, but we are trying to illustrate the burden of contagious diseases in livestock as a gradient in Europe. This is the reason why Norway must have a different focus compared to continental Europe when it comes to defense against these infections.
- ✓ You see that for the cattle diseases, Norway and Sweden definitely have the most favorable situations with Denmark in the middle. The other three countries have a significantly higher prevalence of infections.

6 important contagious cattle diseases in Norway and 5 EU countries



OIE, WAHIS, EU ADNS

	Norway	Sweden	Denmark	Netherlands	Great Britain	France
Tuberculosis	Green	Green	Green	Yellow	Red	Yellow
Paratub.	Yellow	Green	Red	Red	Red	Red
BVD	Green	Green	Green	Orange	Red	Red
IBR/IPV	Green	Green	Green	Orange	Orange	Orange
<i>Salmonella</i>	Yellow	Yellow	Orange	Orange	Red	Red
<i>Mycoplasma bovis</i>	Green	Orange	Red	Red	Red	Red

6 important contagious small ruminant diseases in Norway and 5 EU countries

<http://www.oie.int/wahis>



	Norway	Sweden	Denmark	Netherlands	Great Britain	France
Classical scrapie	Green	Green	Green	Yellow	Yellow	Yellow
Paratub.	Green	Green	Red	Red	Red	Red
Mædi/CAE	Yellow	Yellow	Orange	Red	Red	Red
Footrot	Yellow	Yellow	Orange	Yellow	Red	Yellow
Border disease	Green	Green	Red	Red	Red	Red
Q-fever	Green	Orange	Red	Red	Red	Red

You will see the same patterns for small ruminants. But Denmark is probably closer to continental Europe for small ruminant compared to cattle. However, if we had chosen Q fever also for cattle there would have been three red cells for Denmark also for cattle.

6 important contagious swine diseases in Norway and 5 EU countries

OIE, WAHIS og EU ADNS. ESNIP3, Giorgi Metreveli PhD.-thesis

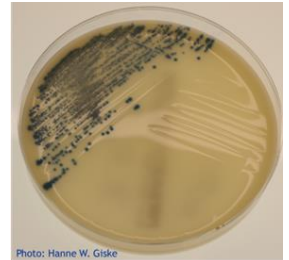
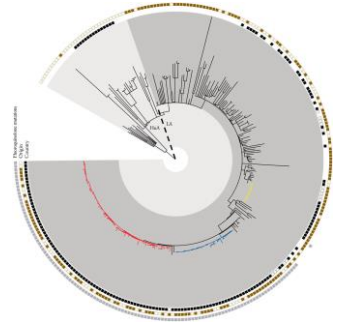


	Norway	Sweden	Denmark	Netherlands	Great Britain	France
African swine fever	Green	Green	Green	Green	Green	Green
Classical swine fever	Green	Green	Green	Green	Green	Green
PRRS	Green	Green	Red	Red	Red	Red
Pseudorabies	Green	Green	Green	Green	Green	Red
Influenza A	H1N1 09	Red	Red	Red	Red	Red
<i>Mycoplasma hyopneumon.</i>	Green	Red	Red	Red	Red	Red

For contagious swine diseases, Norway is in front of everyone else, and there is a high likelihood that more countries will be affected by African swine fever in the years to come.

Livestock associated MRSA in Norway

- ✓ A surveillance and eradication strategy of LA-MRSA in the pig population from 2014
- ✓ Aim: To prevent pig holdings to become a persistent source of MRSA to humans
- ✓ Annual screenings has been performed, with contact tracing on findings
- ✓ All LA-MRSA herds have been subject to measures to eradicate the agent
- ✓ The strategy has so far been effective, although costly and labour intensive
- ✓ We believe that the prevention of human introduction of LA-MRSA is of the utmost importance if the current strategy is to prove feasible and successful in the longer term.



6 important contagious poultry diseases in Norway and 5 EU countries



OIE, WAHIS, EU ADNS, EFSA's «EU summary report on trends and sources of zoonoses, zoonotic agents and food-borne outbreaks in 2016”

	Norway	Sweden	Denmark	Netherlands	Great Britain	France
HP avian influenza ¹	Green	Yellow	Green	Orange	Yellow	Orange
LP avian influenza ¹	Green	Green	Green	Orange	Green	Orange
Newcastle disease ²	Green	Green	Green	Green	Green	Green
Infectious laryngotracheitis ³	Yellow	Yellow	Yellow	Red	Red	Red
Infectious bronchitis ³	Yellow	Red	Red	Red	Red	Red
<i>Salmonella</i> ⁴	Green	Green	Green	Yellow	Yellow	Yellow

¹ Detected in poultry in 2017

² No vaccination in Norway and Sweden

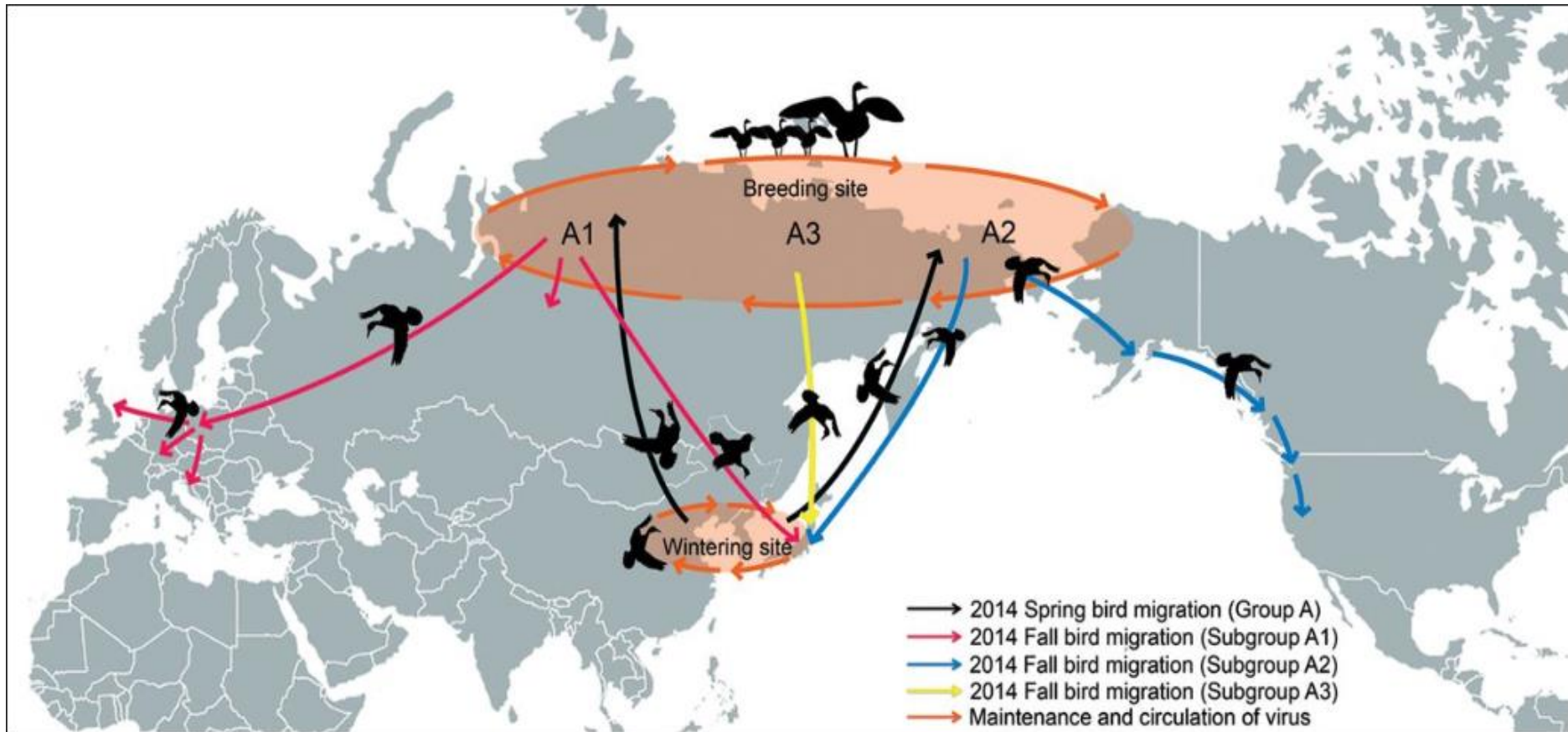
³ Prevalent in hobby flocks

⁴ A Salmonellaguarantee in No, Sw, DK and FI

Poultry and swine are generally housed indoors in Norway and this makes it easier to create barriers to reduce the risk of introducing infections. For poultry, geographic location with respect to migration routes and density of wild birds is an obvious risk factor.

Indicative transmission routes of HPAI A (H5N8) through birds migrating into Europe

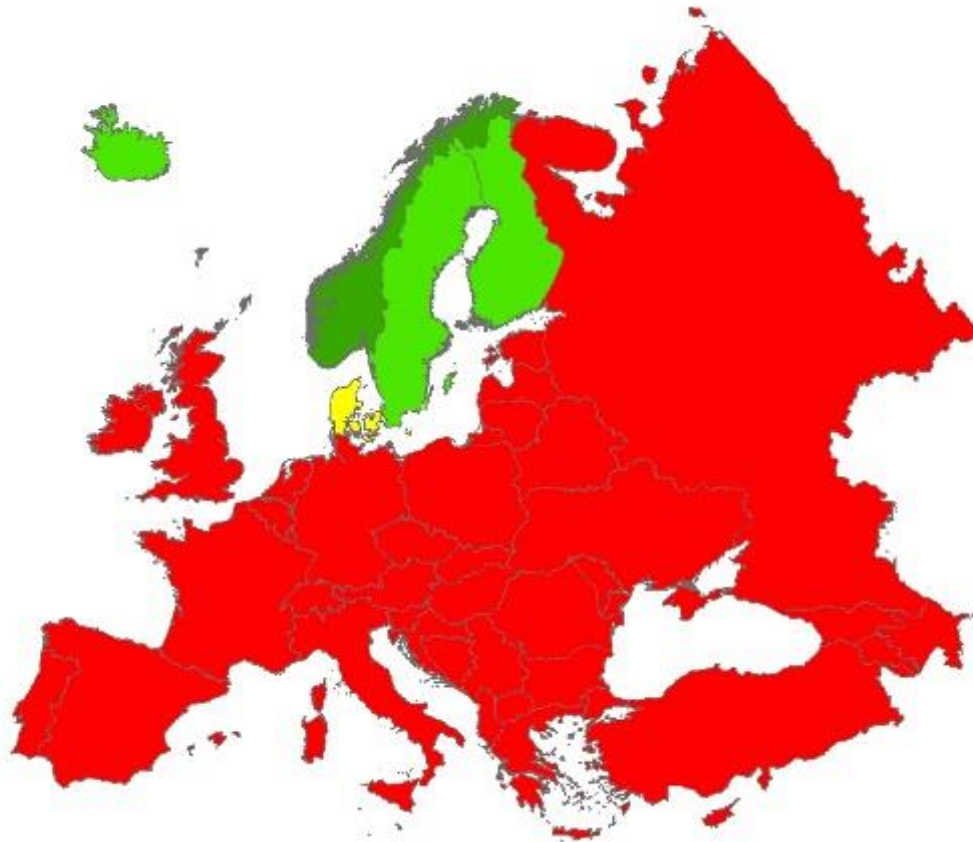
There is little doubt that migratory birds have introduced outbreaks of Newcastle disease and avian influenza in our neighbouring countries.



Important reasons for our favourable status

Basically it can be summarized by this map.

- ✓ Our favourable status can partly be explained by natural conditions that make it easier to avoid emerging and reemerging contagious diseases that affect continental Europe. There is a contagious animal disease gradient between continental Europe and Norway, Sweden, Finland and Iceland. And the Baltic Sea, Skagerak and Kattegat seem to be a part of our defence.
- ✓ But most important are the great historic and present efforts made to prevent, control and eradicate contagious diseases.



Reasons for our favourable status

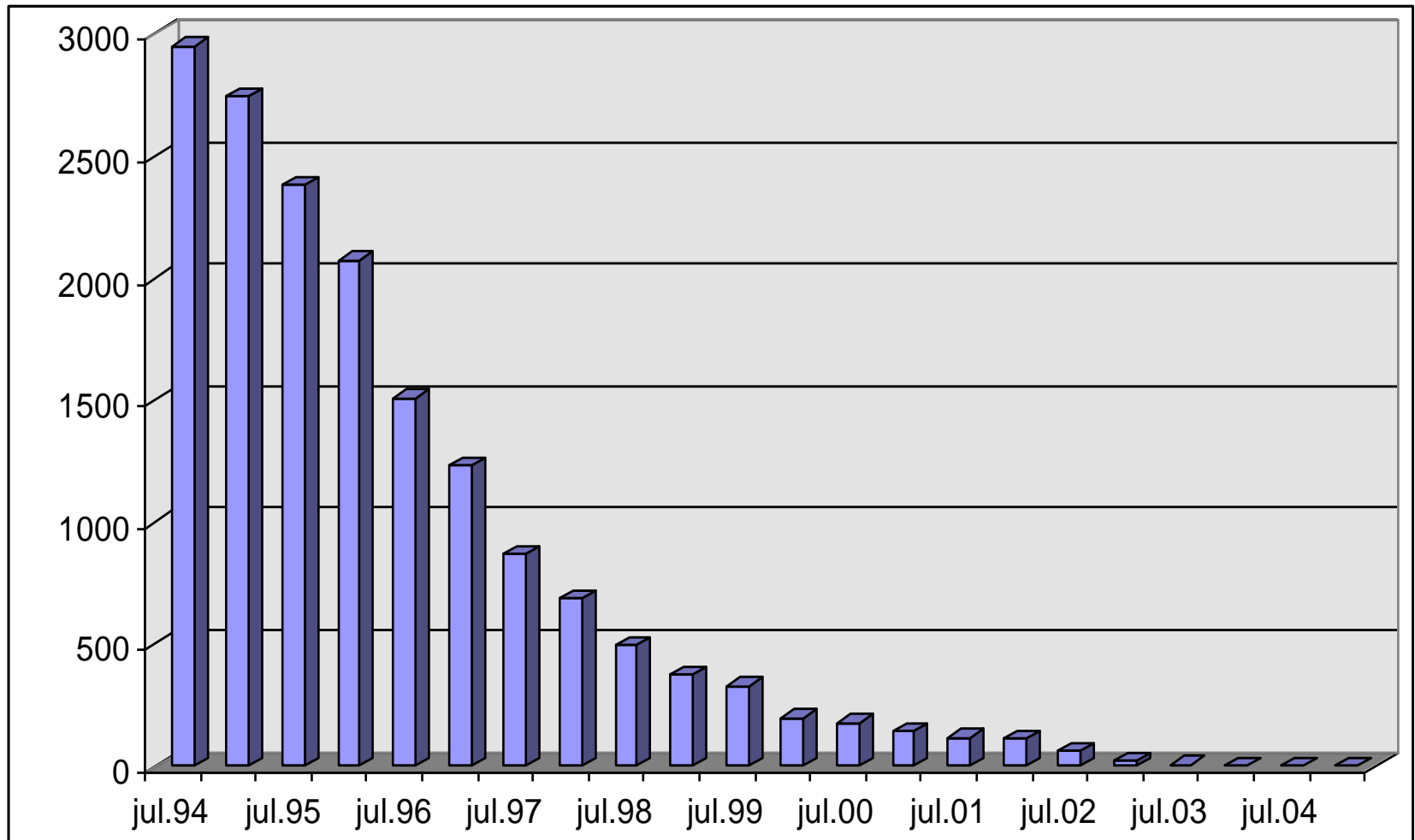


**Dr. med. Ole Olsen Malm
(1854-1917)**

1. Located at “the top” of Europe surrounded by the sea and “very good neighbours”
2. Small livestock units and a small livestock population spread over a large geographical area
3. Limited import of livestock and livestock products from countries with less favourable disease situations
4. A well- organized and well developed livestock industry and veterinary services
5. Contagious diseases have been systematically combatted for more than 100 years. The Nordic pioneers that worked to combat tuberculosis and brucellosis, initiated a success-story and we are standing on their shoulders today.

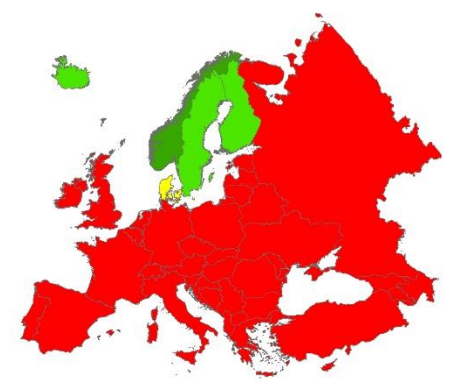
Bovine virusdiarrhoea (BVD)

The number of herds with restrictions



International experts didn't believe that BVDV eradication was possible. But the Nordic countries ignored these advices and succeeded by means of the Nordic model with a persistent collaboration between the Authority, the Industry and the Scientific institutions. And not to forget, the loyalty of the farmers and field veterinarians.

Why and how do we document our zoonosantary status?



✓ Passive surveillance (based on clinical symptoms)

✓ Depends of the eyes and ears of skilled farmers and field veterinarians

✓ Active surveillance

1. A number of official surveillance and control programmes run by the Food Safety Authority
2. Elimination programmes run by the livestock industry

The official surveillance and control programs can be divided in three different types

1. Mandatory EU-programmes



2. Programmes approved by EU

3. National programmes

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Design and methods decided by OIE or EU

Several of these programmes are run with support from the livestock industry

Official cattle programmes in 2018

Programmes according to EU-directives and regulations	Programmes approved by EU	National programmes
Bovine spongiform encephalopathy (1998)		
Enzootic bovine leucosis (1994)		Paratuberculosis (1996)
Bovine tuberculosis (2000)	IBR/IPV (1992)	Bovine virusdiarrhoea (1992)
Brucellosis (2000)	<i>Salmonella</i> (1995)	
Residual substances (1999)		
Bluetongue (2008)		

As an example, here are the official cattle programmes in 2018. The 8 programmes in the first two columns are fairly locked in the EU legislation. Most of the money we spend on animal disease surveillance are used on these programmes. It is the national programmes we can change, increase and strengthen if there are zosanitary needs for that.

From our point of view, we should strengthen the paratuberculosis program and establish new programs for *Mycoplasma bovis* and Q fever. It may look like Norway is a single swallow free of these two, but we are surrounded and have no time to lose.

Together with the livestock industry, we have now initiated a screening study on *Mycoplasma bovis*.

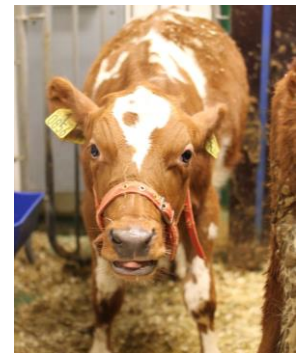
Elimination programmes run by the livestock industry

often run with support from the authorities and the competence institutions

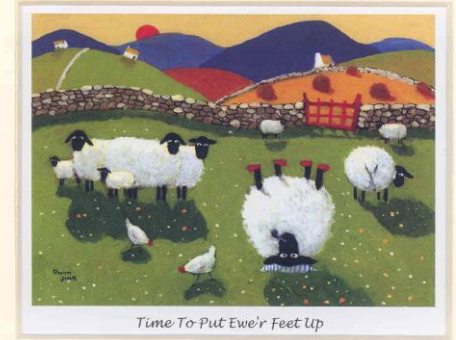
- ✓ «Healthier goats» (caprine arthritis encephalitis, caseous lymphadenitis and paratuberculosis)
- ✓ «Healthy feet» (*Dichelobacter nodosus*)
- ✓ The *Mycoplasma hyopneumonia* programme
- ✓ The bovine respiratory syncytial virus (BRSV) and bovine corona virus (BCoV) elimination programme



During the last 20 years, the livestock industry has been increasingly engaged in animal disease elimination programmes. For many of these, the results have been outstanding in an international context. The coordinated efforts by a unified industry, the authorities and the scientific institutions is regarded as the key. There is currently a major program for two highly contagious and important viral diseases in cattle.



What has been achieved with our programmes



- ✓ Complying with the EU legislation
- ✓ The national programmes are a prerequisite for the “testing” of imported live animals
- ✓ Economically important diseases have been discovered and controlled
- ✓ Propability of "freedom" has been calculated for BVD, Aujeszky's disease and brucellosis
- ✓ Increased awareness of diseases and prevention
- ✓ Several programs are important for the export of breeding materials

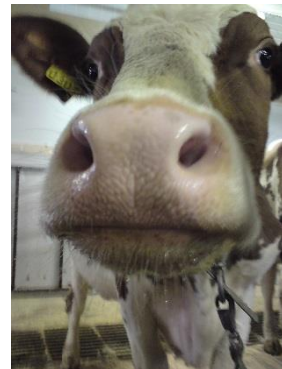
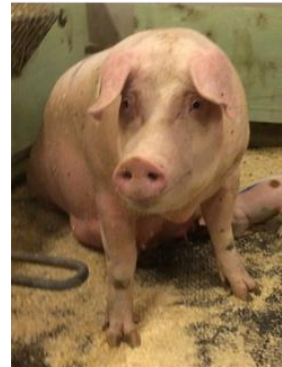
Surveillance often means continuous monitoring. It costs a lot and the question is - is it always necessary?

We think that the answer is both yes and no:

- ✓ The EU-programmes are based on continuous monitoring, and we must implement them. However, if we look back, we have spent a tremendous amount of money on the BSE-programme during the last 20 years, investigated about 300 000 cattle and have found one atypical case.

On the other hand:

- ✓ Documentation of disease freedom is always based on a long period of surveillance
- ✓ There is a continuous threat from outside because of globalization and migratory birds etc.
- ✓ Many of our national programmes survey pathogens we still may find in our livestock population.



How quickly can we detect contagious diseases with today's resources

Depends on the pathogen, the sampling strategy, the methods applied etc.

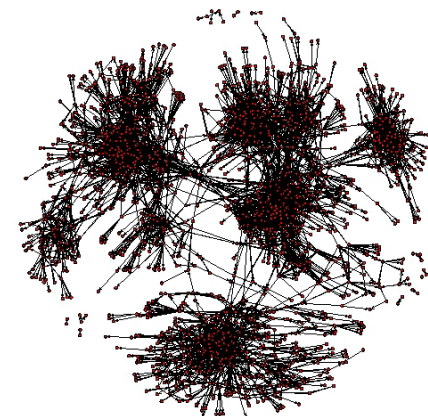
1. Pathogens that cause clinical symptoms

- ✓ will be detected early in most herds and flocks
- ✓but depends on veterinarians and farmers emergency preparedness, reporting and prevention



2. Pathogens that cause subclinical infection

- ✓ may take months or years before they are detected
- ✓ Only the MRSA programme for swine is designed for early detection



Is it possible to retain our favourable disease situation in a globalized world?

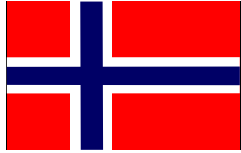
Important air routes in the world



“Yes we can!”

- ✓ Restricted import of farm animals
- ✓ Avoid illegal import of animal products
- ✓ Proper testing of imported animals and “herdsmen”
- ✓ Focus on big herds and new production systems
- ✓ Well-functioning Food Safety Authority
- ✓ A strong and co-operating industry
- ✓ Co-operation, co-operation and co-operation between them over time





Challenges in Norway!

✓ Domestic animal trade

- ❖ Extensive trade and transboundary movement of live animals is a mighty enemy of contagious disease control.

✓ On-farm biosecurity systems

✓ Bigger herds

✓ New systems

✓ Concentrated production



Necessary with a continuous focus on.....

- ✓ Research
- ✓ Preparedness in the whole “food production chain”
- ✓ Health-Pyramids
- ✓ Biosecurity and hygienic measures within and between herds



Norway's advantages:

- ✓ A small human population with short distances between the authorities and people
- ✓ Confidence, loyalty and co-operation between the authorities and the livestock industry
- ✓ Economic compensation related to culling
- ✓ Well-educated farmers
- ✓ A support network (fellow producers, engaged advisors and veterinarians etc.)

