Nordic Council
of Ministers

Veterinary Contingency Planning

The Proceedings of a Nordic-Baltic Seminar on contingency planning with
focus on vaccination, animal welfare, wildlife and costs

3-4 October 2018, Riga, Latvia

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Siri M. Løtvedt, Edvīns Oļševskis, Jørgen M. Westergaard and Anna Huda

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Nordens Hus
Ved Stranden 18
DK-1061 Copenhagen K, Denmark
Tel.: +45 3396 0200
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Preface

This publication was prepared as an outcome of the Seminar on Animal Health Contingency Planning in the Nordic – Baltic Countries, 3–4 October, Riga, Latvia with financial support provided from the Nordic Council of Ministers. The Seminar was organized by the Nordic-Baltic Veterinary Contingency Group.

The publication contains the abstracts prepared for the 4 sessions entitled:

- Vaccination – vaccines and vaccination programmes
- Animal welfare during disease outbreaks – legislative and practical aspects
- Wildlife – a reservoir for animal and zoonotic diseases
- Costs – biosecurity and outbreaks

In addition, information is given under the headings:

- Observations and conclusions.
- Recommendations.

Further, the seminar programme, results from the evaluation of the seminar, participants and information on the Nordic-Baltic Veterinary Contingency Group are included in Annexes.

The seminar was attended by 76 participants coming from 12 countries: Bulgaria, Denmark, Estonia, Finland, Greenland, Iceland, Latvia, Lithuania, Norway, Sweden, the Netherlands and the United Kingdom.

The editors gratefully acknowledge the contributions from chair persons, speakers and participants for their help in developing and clarifying ideas valuable for animal health contingency planning.

Figure 1: The logo of the Nordic-Baltic Veterinary Contingency Group

Summary

The Nordic-Baltic seminar on Contingency planning with focus on vaccination, animal welfare, wildlife and costs was held on 3–4 October 2018 in Riga, Latvia.

The objectives of the seminar included:

- To review the vaccination situation in 2018 with regard to foot-and-mouth disease (FMD) African swine fever (ASF), classical swine fever (CSF) avian influenza (AI) and lumpy skin disease (LSD) having focus on emergency vaccination;
- To highlight and exchange views on animal welfare related to keeping food producing animals, trade in animals and controlling disease emergencies;
- To address the importance of and methods of passive and of active surveillance for emerging and exotic diseases in wildlife;
- To share knowledge and experience on costs associated with outbreaks of Avian influenza and of African swine fever and the application of farm biosecurity measures.

Day one of the seminar had focus on vaccines and vaccination against exotic diseases, emergency vaccination against LSD and the control of influenza and on animal welfare aspects during FMD outbreaks and the application of animal welfare rules in the Nordic-Baltic countries during depopulation of herds/flocks.

Day two of the seminar highlighted the importance of wildlife as a reservoir for animal and zoonotic diseases and the costs associated with the application of biosecurity at farm level and eradication measures during AI, ASF and FMD outbreaks.

The seminar had 76 participants from 12 different countries; Bulgaria, Denmark, Estonia, Finland, Greenland, Iceland, Latvia, Lithuania, Norway, Sweden, the Netherlands and the United Kingdom.

The presentations made during the seminar by speakers coming from 6 different countries provided an excellent basis for a valuable exchange of views between seminar participants on issues important for veterinary contingency planning and for an enhanced networking involving veterinary administrators, scientists and representatives of the livestock sector in the Nordic-Baltic countries. Based on the exchange of views during the seminar 5 recommendations were adopted.

The recommendations covered aspects of:

- Vaccination
- Stamping-out
- Animal welfare
- Contingency plans
- Vector-borne diseases

The full text of the recommendations is given in the section: Observations, conclusions and recommendations (section 3)

1. Opening Session

The participants of the seminar were at the opening session welcomed by Dr. Edvīns Oļševskis, Deputy Director of Veterinary Surveillance Department of the Food and Veterinary Service of Latvia and by Dr. Siri Løtvedt, chairman of the Nordic-Baltic Veterinary Contingency Group.

In the opening speech, Dr. Edvīns Oļševskis expressed a warm welcome to all participants and the pleasure of seeing so many experts coming to Riga for sharing views and discussing the important issues of contingency planning. He highlighted the similarities of the countries of the Nordic-Baltic region in a context of geographical location as well as linked to common animal diseases and challenges. Good collaboration is already established between the Nordic-Baltic countries and such seminars, where animal diseases and zoonosis experts can meet face to face and discuss events and future activities, keep collaboration in live and even stronger. As Latvia and other two Baltic countries celebrate 100 years Anniversary this year, special congratulations were expressed to colleagues from Estonia and Lithuania.

The speech given by Dr. Siri Løtvedt is presented below.

"I would like to welcome all of you to this Nordic-Baltic Seminar on Animal Health Contingency Planning. The focus will be on vaccination, animal welfare, wildlife and costs. A special warm welcome is directed to the speakers in the seminar who all are contributing to make this seminar possible. I would also like to thank the Latvian authorities who are hosting this event.

The Nordic-Baltic Veterinary Contingency Group was officially established in 2006 after an initiative from the Nordic Council of Ministers. The primary objective of the group is to improve cooperation, communication and the exchange of information and experience between the veterinary authorities within the Nordic Baltic region and on international level, in the context of contingency planning and during animal disease crises. The secondary objective is to increase awareness of epizootic diseases among professionals and stakeholders within the region, to identify areas of improvement in contingency planning and also to obtain and spread knowledge related to fighting infectious animal diseases.

In order to reach these goals, the group has arranged a number of activities over the years. These include international simulation exercises on epizootic diseases, seminars with invited speakers, expert meetings and regular meetings of the group, training activities and so on. The group consists of experts from veterinary authorities in the eight Nordic and Baltic countries. We would like to thank the Nordic Council of Ministers for the financial support that makes our activities possible.

I will now introduce you to the other members of the group. The head of the organizing committee for this seminar comes from our host country Latvia, Edvīns Oļševskis, from Iceland comes Sigridur Gísladóttir, from Denmark Anna Huda, from Finland Hanna Lounela, our new member from Sweden, Thomas Svensson, from Estonia Maarja Kristian; and from Lithuania Paulius Busauskas. Last but not least our invaluable consultant from Denmark Dr. Jørgen Westergaard who has been a key person from the very beginning.

In the future we are planning a mini seminar in spring 2019 on handling of carcasses and animal by-products during outbreaks of animal diseases, a Nordic-Baltic exercise in autumn 2019, and a vector seminar in 2020.

We will start the seminar today with three presentations about available vaccines, emergency vaccination and vaccination in a One Health perspective. Later we will focus on animal welfare during disease outbreaks and depopulation.

Tomorrow we will hear about wildlife as a reservoir for animal and zoonotic diseases. We will hear about African swine fever, viral diseases and vector-borne infections in wildlife, and the CWD outbreak in Norway.

The last session is about costs: costs for biosecurity, outbreaks of FMD, avian influenza and for African swine fever. This topic is a follow up from the mini-seminar we arranged in Helsinki last spring about costs of contingency planning and outbreaks of animal diseases.

As you can see, we are looking forward to many interesting presentations.”

2. Abstracts

2.1 Session I

2.1.1 *Vaccines and vaccination against exotic animal diseases (FMD/CSF/LSD/ASF) 2018*

Professor Anette Bøtner, DTU National Veterinary Institute, Denmark

In the face of an outbreak of an exotic disease within Europe, a number of control measures can be implemented. These include imposing enhanced biosecurity, stamping out of infected herds, restrictions on animal movements, increased surveillance and the use of emergency vaccination. Clearly, the selection of measures actually used will depend on the specific circumstances and the availability of manpower and vaccines. Use of vaccination against FMD, CSF, LSD and ASF is not allowed during “peacetime” due to interference with serological surveillance and trade restrictions. For FMD, CSF and LSD, there are commercially available vaccines, and vaccine banks exist for FMD and LSD. In the case of FMDV, it is important to determine the match between available vaccines and the specific outbreak strain before deciding which vaccine to use. When using emergency vaccination, it is important to be able to differentiate between vaccinated animals and those that have been infected (DIVA). Therefore, there has been a major focus on the DIVA properties of vaccines. To date, the focus of DIVA has been on the use of serological tests but genetic tests to discriminate between vaccines (e.g. based on live attenuated viruses or viral vectors) and field strains of virus are also possible (genetic DIVA) and may become increasingly important. Due to the continuing spread of ASF in Eastern Europe, there is considerable concern about the introduction of the virus into additional countries and a major threat to those that have large pig production industries. Thus, there is a need for improved control measures against this virus. Unfortunately, currently no vaccine is available to combat ASFV.

2.1.2 *Emergency vaccination with special reference to Lumpy skin disease*

Dr. Alexandra Miteva, Bulgarian Food Safety Agency, Bulgaria

Lumpy skin disease (LSD) is an emerging viral disease of cattle and domestic buffalo, with a major socio-economic impact.

The disease causes substantial production losses for the cattle farming industry at all levels due to clinical signs, sometimes death, restrictions to cattle movements and trade.

Endemic in most African countries the LSD has spread steadily north and emerged the Middle East in last few years. Since 2012, when Israel and Lebanon reported LSD a new dynamic of the disease has been observed in Europe – the disease spread rapidly throughout the territory of the country Turkey, Azerbaijan, Armenia, Russia and Balkan countries.

LSD is vector-borne, and notoriously difficult to eradicate without vaccination. Most effective option for controlling the spread of LSD is achieved through coupling stamping out strategy with mass vaccination in reaching a vaccine coverage of at least 85 percent. There is no a single country have managed LSD without vaccination. Vaccination is most effective if applied before the virus enters a country or before vector season.

Only live vaccines are currently available against LSDV – none of them authorised for use within the European Union. The decision to introduce vaccination against LSD as a supplement to control measures shall be taken by the Commission, in cooperation with the Member State concerned, as laid down in Directive 92/119/EEC.

Emergency vaccination against LSD is being applied in Bulgaria in the light of continuing outbreaks of LSD. Bulgaria reported its first cases of LSD on 13 April 2016 following surveillance for the disease as a result of an increased risk of incursion from affected areas in Greece and Turkey.

Many factors should be considered to the decision to introduce vaccination: direct and indirect costs for all the different control strategies for different scenarios, movement and trade restrictions, official country disease status and the consequences.

2.1.3 *Control of influenza in a One Health perspective – do we have the tools, and are they used properly?*

Professor Lars Erik Larsen, National Veterinary Institute, Technical University of Denmark, Denmark

Infection with Influenza A virus (IAV) continues to be a threat for animal and human health globally. Outbreaks in poultry especially with high pathogenic (HPAI) strains of H5 and H7 have a huge negative impact on the production economy in Europe and North America; and in developing countries outbreaks possess a severe threat to food security especially in undeveloped regions.

HPAI AI is enzootic circulating in Asia and in the Middle East, whereas outbreaks in Europe and North America have epizootic character, and are caused either by HPAI strains introduced by migrating birds or by mutated low pathogenic (LPAI) strains. LPAI is enzootic in wild birds globally.

In EU, passive surveillance of wild birds is mandatory and financially supported, whereas passive surveillance is performed voluntary in some European countries without any transnational coordination. H5/H7 HPAI and LPAI outbreaks in domestic birds are controlled by stamping out and establishment of control zones and leads to restrictions on export of poultry and poultry products.

In contrast to IAV in birds, there are no regulations in place on IAV in other species such as swine, mink and horses. IAV is enzootic in swine globally and a wide range of different subtypes, including subtypes containing genes from seasonal human influenza viruses, are circulating in swine, with different patterns in different countries. Nevertheless, swine can be moved freely within Europe without any requirement for test for active infection with influenza.

During recent years, several countries have reported on severe outbreaks of IAV in mink either caused by strains circulating in swine, by human seasonal strains or even new reassorted strains containing genes from human and swine influenza strains. Thus, mink seem to be very susceptible for IAV and may represent a potential and overlooked vessel for generation of reassorted strains with zoonotic perspectives. As for swine, no formal surveillance programs are in place for mink and outbreaks are not reported and no restrictions put on infected farms.

2.2 Session II

2.2.1 *Stamping-out during foot and mouth disease emergency situations and animal welfare*

Dr. Fred Landeg, Formerly acting UK Chief Veterinary Officer, Defra, UK

Countries, including Member States of the EU, which are foot-and-mouth disease (FMD) free without vaccination, have a policy of stamping out to deal with incursions of disease. Stamping out involves the killing of infected herds, safe carcass disposal, cleaning and disinfection. In addition, area restrictions are imposed to prevent the direct or indirect spread of infection by the movement of animals and fomites and to carry out surveillance. EU legislation is in place to protect the welfare of animals on infected farms at the time of killing. In an extensive, prolonged outbreak, severe animal welfare problems also arise on livestock premises because of movement restrictions.

The nature and scale of these problems are illustrated by the UK outbreak in 2001, where the number of animals killed for welfare reasons (2.3 million) greatly exceeded the number of animals killed on confirmed infected premises (1.3 million). Prophylactic vaccination for FMD is prohibited in the EU, but emergency vaccination (either suppressive or protective) may be used as an adjunct to stamping-out. Whether, when and where to use vaccine in the face of an outbreak are problematic with current vaccine technology and DIVA tests. It remains the case that "Prevention is better than Cure" and measures to limit the extent of an outbreak are explored in the light of the lessons learned from the UK outbreak.

2.2.2 *Ensuring animal welfare during depopulation for disease control in the Nordic-Baltic countries*

Dr. Hanna Lounela, DVM, Evira, Finland

The Nordic-Baltic Veterinary Contingency Group (N-BVCG) consists of members from the veterinary authorities of the Nordic and the Baltic countries. The main purpose of the group is to improve cooperation, communication, and exchange of information and experiences between the veterinary authorities within the Nordic-Baltic Region, in the context of contingency planning and during animal disease emergencies. For this session, information about killing methods planned and used in the member countries was collected through a questionnaire in order to share good practices and allow learning from each other.

Depopulation of farm animals is a vital part of disease control measures and eradication of many highly contagious animal diseases. In addition, killing of wildlife has been seen as necessary for combating some diseases. The council regulation (EU No 1099/2009) on the protection of animals at the time of killing sets the legal basis for killing methods and other regulations during depopulation in all Nordic and Baltic countries. Ensuring animal welfare during depopulation cannot be overlooked, even though conditions for killing might be difficult, resources for the actions not easily available and/or sometimes the regulation cannot be followed. With good contingency planning, standard operation procedures and frequent exercises it is possible to improve good animal welfare during depopulation. Most experience in the Baltic countries on depopulation has been gained from killing pigs with electricity and CO₂ and in the Nordic countries from occasional depopulation of poultry with CO₂ or killing fish. There is lack of experience in depopulating cattle farms in the member countries. There are differences in the backgrounds of the personnel used in depopulation activities and in the training available for the teams, as well as whether or not there are existing contracts with private partners. Sharing information, as well as maybe personnel and equipment, in addition to arranging joint exercises, are considered important in order to improve animal welfare and effective disease eradication in the member countries.

2.2.3 *African swine fever in wildlife: lessons learned*

Dr. Paulius Busauskas, State Food and Veterinary Services, Lithuania

On 24 January 2014, Lithuania notified two primary cases of African swine fever (ASF) in wild boars. From this period Lithuania notified more than 3,000 cases of ASF in wild fauna for hunted and found dead wild boars.

The wild boar inhabits a diverse array of habitats from boreal taigas to deserts. The main habitats favored by wild boars in Europe are deciduous and mixed forests, with the most favorable areas consisting of forest composed of oak and beech en-

closing marshes and meadows. How much do we know about the wild boars. At present, there are more questions than answers about how far wild boars can move. Also there are a lot of risk factors to spread the disease in wild boars population. The virus can be transmitted by direct and indirect contacts. The rate of infection also depends of the wild boar population size and density.

Based on 4 years of experience, it can be stated that passive surveillance is the golden key and do not delay the diagnosis of ASF in free areas. According to risk assessment in high risk areas all found dead wild boars must be tested. Compensation mechanism for reporting of found dead or killed in road incidents wild boars should be foreseen.

The implementation of high biosecurity measures for hunters is one of the main requirements to prevent disease spreading from one area to another. Close cooperation between hunters and competent authorities is crucial. The hunters are our eyes and ears so we need to provide trainings for hunters about biosecurity, explain them the epidemiological role played by wild boars and the major risk linked to hunting activities.

To fight with ASF is quite hard, but then you are well prepared the ASF does not seem so scary.

2.3 Session III

2.3.1 *Emerging vector-borne infections in Europe – prevention, early detection, control and the impact of wildlife*

Dr. René Bødker, DTU National Veterinary Institute, Denmark

Vector-borne infections continue to emerge and spread in Europe. Climate, environmental change and globalisation may be important drivers, but there is no simple explanation for this development.

Migrating birds play an important role in the introduction of new vector-borne pathogens. In 2018, mosquito-borne West Nile virus spread further north than ever before reaching far into Germany. Mosquito-borne zoonotic Usutu virus, which also has a reservoir in wild birds, has in recent years resulted in large outbreaks in birds in Holland and Germany. Migrating birds may also introduce new tick species, and the number of Hyalomma ticks recorded in Germany in 2018 was massive. These ticks are potential vectors of the zoonotic Crimean-Congo hemorrhagic fever virus.

Exotic mosquitoes are firmly established in southern Europe and continue to move north. Some of these new mosquitoes are vectors of important human pathogens like dengue, chikungunya and Zika virus with the former two already responsible for serious outbreaks in humans in southern Europe. The zoonotic pathogens with their reservoirs in wild and domestic animals are benefitting from the increased abundance of wildlife and increasing temperatures. Recently the spread of African swine fever from wild pigs to domestic pigs has been associated with mechanical vectors in the Baltic countries.

The potential for incursions and spread of vectors and pathogens can be modelled, but detecting actual outbreaks and establishment of new vectors still relies on a combination of active and passive surveillance. New approaches are being developed including citizen science projects successfully detecting and mapping disease vectors as far north as Sweden and Finland.

Control of vector-borne infections with a wildlife reservoir remains a great challenge. With bovine ephemeral fever, epizootic haemorrhagic disease and Rift Valley fever queuing up in the Eastern Mediterranean it may be wise to plan ahead.

2.3.2 *Viral infections emerging from wildlife*

Professor Olli Vapalahti, MD, Ph.D., University of Helsinki, Finland

Emerging infections have at global, regional and local level a great significance for human and animal health, food supply and economy.

The current megatrends favouring emergence include:

- Globalisation;
- Travel;
- Urbanization;
- Environmental changes;
- Industrial animal husbandry; and
- Modern diagnostic tools.

The presentation will highlight general aspects of viral zoonoses emerging from wildlife and the actual viral and disease situation with regard to:

- Rodent and insectivore – borne infections caused by hanta viruses, arena viruses, borna viruses and orthopoxviruses;
- Bird-borne infections caused by influenza A virus and arboviruses;
- Bat-borne infections caused by lyssaviruses.

Finally, the presentation will provide information on surveillance in Europe, disease protective measures, potential treatments and metagenomics approaches to study viral diversity, molecular epidemiology and evolution.

2.3.3 *Chronic wasting disease (CWD) in wildlife*

Dr. Kristin Ruud Alvseike, Norwegian Food Safety Authority, Norway

Chronic Wasting Disease (CWD) is a fatal infectious prion disease that affects cervids. In April 2016, CWD was diagnosed in wild reindeer in Norway. Until then, CWD had only been found in North America and South Korea.

Based on recommendations from national experts, and as a step in the attempt to eradicate the disease, it was decided that the entire infected wild reindeer herd should be culled. The culling of the 2,000 animals was completed Spring 2018, and the test results showed a total number of 19 positive animals. The area will now be left fallow for at least five years. Then the wild reindeer population shall be re-established.

Salt licks in the area, which are potentially a major source of infection, are for the most part fenced in. Fences along selected stretches are erected to keep semi-domesticated reindeer and wild reindeer from the affected area. Some nationwide measures are also introduced, like a restriction on the movement of cervids and a prohibition on feeding wild cervids.

Since April 2016, Norway has performed more than 45,000 tests. The programme covers all types of cervids, both farmed and wild. It also implements the EU-survey programme for CWD.

In addition to the outbreak in wild reindeer, three moose and one red deer have tested positive. This atypical type of CWD differs from the contagious type found in wild reindeer and in North America, and it seems less or not contagious.

Handling CWD is challenging and requires a lot of cooperation between different institutes and organisations. It is also dependent on having sufficient financial resources. An estimated cost from April 2016–January 2019 related to the surveillance programme and other measures performed is about EUR 10 million. This estimate does not include labour by the authorities or others.

2.4 **Session IV**

2.4.1 *Costs of biosecurity at farm level – a good investment*

Dr. Lisbeth Harm Nielsen, Chief consultant, Danish Agriculture and Food Council, Denmark

In order to maintain a high standard of health, animal welfare, meat safety and traceability in Danish swine herds, a private scheme called the DANISH Product Standard was established in 2007. In 2010, DANISH Transport Standard (DANISH) was established. The main purpose of DANISH is to keep Denmark free from unwanted diseases in

hoofed animals. Denmark is highly dependent on pig exports, and would suffer extensive economic losses should an outbreak of disease occur.

The DANISH Standard is a voluntary scheme which addresses pig herds, hauliers of pigs and cattle, exporters and DanBred distributors, cleaning and disinfection stations, and collection centres. The Danish pig producers use annually EUR 2.6 million (2019) on the DANISH Transport-standard. Approved DANISH hauliers are required to use DANISH cleaning and disinfection stations before loading and transporting from DANISH approved herds. Countries outside the EU, countries with borders out of the EU, and countries with certain notifiable diseases on the OIE-list are all considered high risk countries. In Denmark, it is a requirement to register all transports of pigs and cattle in the Central Husbandry Register (CHR). This transport data is merged with a database at the cleaning and disinfection station to verify DANISH compliance. EU-vehicles performing long transports are monitored via GPS and will undergo an imposed quarantine from 12 hours to 7 days in Denmark, if GPS data cannot document and verify that said vehicle has entered only low risk countries within the last 7 days. The quarantine is also imposed if a vehicle has entered any foreign country prior to a national transport. DANISH requires that all vehicles have valid cleaning certificates, and that quarantines are met, before vehicles approach a herd. DANISH approved herds are not allowed to receive animals from non-DANISH approved herds, nor deliver to a non-DANISH approved collection centre. To insure compliance, a penalty will be imposed to participants who do not meet these DANISH requirements.

There has been a project "Danish Disease Control" where we considered a new surveillance system to improve biosecurity in Denmark. In the project, we found that Danish farmers spend about EUR 6.7 million (DKK 50 million) per year on alerts and corrections of movements of live animals which is very important in the work with contagious diseases. EUR 3.7 million (DKK 27.6 million) of the EUR 6.7 million (DKK 50 million) is attributable to the pig industry. In addition, there are costs for the industry every time incorrect information is recorded in the movement databases. There would be a net profit per pig producer per year of approx. EUR 329 (DKK 2,456) with the introduction of "Danish Disease Control". Still this has not been implemented as it is always very difficult to ensure the economic benefit of biosecurity as there has never been this disaster in Denmark.

The majority (95%) of the pigs produced in Denmark are included in the DANISH scheme. Participation increases revenue to farmers and decreases the risk of fatal disease outbreaks. The "Danish Disease Control" has not been implemented in Denmark.

The implementation of the DANISH Transport Standard, which requires additional cleaning and disinfecting of cattle and swine transport vehicles traveling from outside Denmark to Danish livestock herds, insures a low level of dissemination from vehicles. In addition, the quarantine further reduces the risk of dissemination from high risk countries. In other words, DANISH Transport Standard insures low risk of dissemination from foreign countries to Denmark, and between Danish herds. It would be an advantage for biosecurity on the farm, to implement "Danish Disease Control" in Denmark, in the future.

2.4.2 *An epidemiological and economic model analysis of Foot and mouth disease outbreaks in the Netherlands*

Dr. RHM (Ron) Bergevoet, DVM, Wageningen University, the Netherlands

In the recent past, the Netherlands was confronted with large outbreaks of trans-boundary animal diseases, like CSF, FMD and HPAI. Events that changed our thinking on animal diseases control and prevention. Insights helped to update contingency plans, implement preventive measures and added vaccination-to-live strategies since the occurrence of DIVA vaccines to the toolbox of the policy options.

The outbreaks in the Netherlands made clear that just applying EU minimum measures was not sufficient to quickly contain outbreak in a densely populated live-stock area. To support the decision making process, to compare different policy options and to facilitate communication with stakeholders, insights from epidemiological and economic models were used. Comparing and evaluating the outcomes of the models led to common insights. For example:

- In densely populated livestock areas, EU minimum measures are not sufficient to quickly contain an outbreak;
- Consequential losses, borne by the farmers, are substantially larger than the direct losses, borne by government, farmers and EU;
- Vaccination-to-live can substantially decrease the direct costs of the eradication of trans-boundary animal diseases. However, the indirect losses increase and, in case no arrangements are made, need to be borne by the farmers that have to vaccinate their animals. Public-private arrangements need to be made to avoid that these farmers pay the full price of a future catastrophe.

Mainly triggered by the large outbreak of FMD, a number of countries all over the world started to develop these kind of models. Comparing the outcomes of these models lead to vital insights into the specific characteristics of both disease and the structure of a countries' livestock that determine the preference for a specific control strategy, also for countries that do not have these models available.

2.4.3 *Analysis of costs caused by an avian influenza outbreak in Denmark*

Dr. Sten Mortensen, DVM, PhD, Danish Veterinary and Food Administration, Denmark

Avian influenza virus will continue to threaten poultry production everywhere because of the global spread of the virus in wild birds. Due to the zoonotic potential of some strains, avian influenza is not tolerated in the food production chain, and therefore outbreaks affect market access. Outbreaks of the HPAI H5N8 strain in poultry, captive birds and wild

birds all over Europe from December 2016 to January 2018 provided an opportunity to evaluate the direct and indirect cost to the food production value chain in Denmark.

In peacetime, i.e. a time where no outbreaks are detected, the costs of avian influenza are related to the biosecurity standards in the poultry sector, the surveillance system and the traceability system for birds and bird products. It also includes the cost of preparing for the next outbreak and the contingency plan. These costs of the preventive activities burden the poultry and the public budgets recurrently.

If an outbreak takes place, there are direct control costs and indirect costs. The direct costs are related to the culling of the animals, cleaning and disinfection, compensation for the value of the animals killed and the cost related to control activities such as compulsory housing of outdoor poultry.

The indirect costs relate to downgrading of products from free-ranging farms and the decrease in the value of products due to export losses. The indirect costs often outweigh the direct costs of outbreaks.

2.4.4 Analysis of costs caused by African swine fever in domestic pigs and wild boar in Latvia

Dr. Edvīns Oļševskis, Food and Veterinary Service, Latvia

The first African swine fever (ASF) cases in Latvia were confirmed in June 2014 on the border with Belarus. Afterwards, ASF was spreading mostly in wild boar population covering larger and larger territories of the country. In September 2018, almost 90% of the territory of Latvia was infected, presenting high risk of the virus introduction to pig farms, both commercial and non-commercial, located in the infected areas. Since June 2014, more than 4,000 wild boar cases and 63 outbreaks in pig farms (most of them non-commercial) have been detected in Latvia.

The costs of ASF are divided into two categories: direct costs that are mostly related to the implementation of ASF preventive, control and eradication measures in both pig farms and wild boar population; and indirect costs – related to trade restrictions within the country, reduction of meat prices and loss of the export markets etc.

The total amount of direct costs caused by ASF in Latvia during the last four years is close to EUR 20 million. Highest costs are usually related to ASF outbreak eradication in large commercial farms, including culling of pigs and disposal of carcasses, cleaning disinfection and compensations to animal owners.

As ASF virus is continuously present in wild boar population and effective tools to eliminate it from wildlife is limited, high proportion of finances are dedicated to hunters who are essential for ensuring ASF surveillance in wild boar and management of wild boar population.

It is quite difficult to calculate exact amount of indirect costs caused by ASF for a country like Latvia, which is not a large exporter of live pigs, pork and products containing pork. So far, the calculations of indirect costs related to ASF are not done in Latvia.

3. Observations, conclusions and recommendations

3.1 Observations and conclusions

The Nordic-Baltic seminar on Contingency planning with focus on vaccination, animal welfare, wildlife and costs was successful held on 3–4 October 2018 in Riga, Latvia. The seminar had 76 participants coming from 12 countries.

The objectives of the seminar included:

- To review the vaccination situation in 2018 with regard to foot-and-mouth disease (FMD) African swine fever (ASF), classical swine fever (CSF), avian influenza (AI) and lumpy skin disease (LSD) having focus on emergency vaccination;
- To highlight and exchange views on animal welfare related to keeping food producing animals, trade in animals and controlling disease emergencies;
- To address the importance of and methods of passive and of active surveillance for emerging and exotic diseases in wildlife;
- To share knowledge and experience on costs associated with outbreaks of Avian influenza and of African swine fever and the application of farm biosecurity measures.

Day one of the seminar had focus on vaccines and vaccination against exotic diseases, emergency vaccination against LSD and the control of influenza and on animal welfare aspects during FMD outbreaks and the application of animal welfare rules in the Nordic-Baltic countries during depopulation of herds/flocks.

Day two of the seminar highlighted the importance of wildlife as a reservoir for animal and zoonotic diseases and the costs associated with the application of biosecurity at farm level and eradication measures during AI, ASF and FMD outbreaks.

The presentations made during the seminar by speakers coming from 6 different countries provided an excellent basis for a valuable exchange of views between seminar participants on issues important for veterinary contingency planning and for an enhanced networking involving veterinary administrators, scientists and representatives of the livestock sector in the Nordic-Baltic countries. Based on the exchange of views during the seminar five recommendations were adopted.

3.2 Recommendations

3.2.1 Vaccination

The use of emergency vaccination should under certain disease situations be considered as an important tool for the control and eradication of the disease. In each situation, considerations should be given to an exit strategy.

It is recommended that the Nordic-Baltic Veterinary Contingency Group in the planning of future FMD simulation exercises include the element of drafting emergency vaccination programmes.

3.2.2 Stamping-out

During recent decades, the livestock sector has moved in the direction of bigger and bigger production units – industrial animal husbandry.

It is recommended that the Nordic-Baltic Veterinary Contingency Group in the planning of future simulation exercises include stamping-out of large herds or flocks – training for “worst case scenario”.

3.2.3 Animal welfare

Disease eradication during emergency situations is often faced with difficulties due to logistic or environmental conditions and due to shortage of financial or human resources. Movement restrictions established as a result of outbreaks may create special animal welfare problems.

It is recommended the Nordic-Baltic Veterinary Contingency Group during workshops and seminars simulation exercises assist in highlighting the importance of the application of the appropriate animal welfare rules related to the handling of animal disease emergencies.

3.2.4 Contingency Plans

A successful implementation of contingency plans established by National Veterinary Administrations will often depend on input from institutions, organizations and firms designated to provide assistance during emergency situations. Such inputs could relate to culling of animals, cleaning and disinfection, purchase of vaccines, etc.

It is recommended that the Nordic-Baltic Veterinary Contingency Group in the future activities include a training session in preparation of contracts and call for tender procedures.

3.2.5 *Vector borne diseases*

Climate, environmental change and globalization appear to be important drivers with regard to incursions and spread of vector-borne diseases in the Nordic and Baltic countries. The wildlife is the reservoir for many vectors.

It is recommended that the Nordic-Baltic Veterinary Contingency Group organizes activities with focus on vector-borne diseases affecting the health of humans and animals.

Literatures

Regulation (EU) 2016/429 of the European Parliament and of the Council of 9 March 2016 on transmissible animal diseases and amending and repealing certain acts in the area of animal health ("Animal Health Law") OJ L 84, 31.3. 2016, pp. 1–208.

Sammendrag

Det Nordisk-Baltiske seminar omhandlende beredskabsplanlægning med fokus på vaccination, dyrevelfærd, den vilde fauna og økonomiske udgifter blev afholdt fra den 3. til 4. oktober 2018 i Riga, Letland.

Formålet med seminaret omfattede:

- At gennemgå vaccinationssituationen i 2018 med hensyn til mund- og klovesyge, afrikansk svinepest, klassisk svinepest, fugleinfluenza og lumpy skin disease med fokus på nødvaccinationer.
- At henlede opmærksomheden på og udveksle synspunkter vedrørende dyrevelfærd relateret til hold af produktionsdyr, handel med dyr og kontrol med sygdomme i kritiske situationer.
- At adressere betydningen af og metoder til aktiv og passiv overvågning af nye og eksotiske sygdomme i den vilde fauna.
- At dele oplysninger og erfaringer omhandlende udgifter associeret til udbrud af fugleinfluenza og af afrikansk svinepest og om anvendelse af smittebeskyttelsesforanstaltninger på gårde.

Den første dag på seminaret havde fokus på vacciner og vaccination mod eksotiske sygdomme, nødvaccinationer mod lumpy skin disease, kontrollen med influenza, dyrevelfærd og forhold i forbindelse med udbrud af mund- og klovesyge samt på anvendelsen af regler for dyrevelfærd i de Nordiske og Baltiske lande ved aflivning af besætninger.

På seminarets 2. dag belystes betydningen af den vilde fauna som reservoir for sygdomme hos dyr og zoonoser, samt udgifterne kædet sammen med anvendelsen af smittebeskyttelsesforanstaltninger i husdyrproduktionen og bekæmpelsesforanstaltninger benyttet ved udbrud af fugleinfluenza, afrikansk svinepest og mund- og klovesyge.

Seminaret havde 76 deltagere, som kom fra 12 forskellige lande: Bulgarien, Danmark, Estland, Finland, Grønland, Island, Letland, Litauen, Norge, Sverige, Holland og Det Forenede Kongerige.

Alle indlæg på seminaret, som blev givet af foredragsholdere fra 6 forskellige lande, gav et enestående grundlag for værdifuld udveksling af synspunkter imellem seminarets deltagere på emner af betydning for planlægning af det veterinære beredskab og for at fremme udbygning af netværket imellem veterinær administrationer, videnskabsfolk og repræsentanter fra husdyrbrugs sektoren i de Nordiske og Baltiske lande. På baggrund af udvekslingen af synspunkter under seminaret blev der vedtaget 5 anbefalinger. Anbefalingerne vedrører forhold omhandlende:

- Vaccination;
- Nedslagning af besætninger;
- Dyrevelfærd;
- Beredskabsplaner;
- Vektorbårne sygdomme.

Den fulde ordlyd af anbefalingerne er givet i afsnittet, der omtaler observationer, konklusioner og anbefalinger (Afsnit 3).

Acknowledgements

The organizers of the Nordic-Baltic seminar on Contingency planning – focusing on: vaccination, animal welfare, wildlife and costs – would like to express their thanks to the Nordic Council of Ministers for the political support and the financial support made available for the preparation, implementation and evaluation of the seminar.

The support made it possible for the national experts from the Nordic and Baltic countries, Bulgaria, the Netherlands and the UK to meet and discuss topics of mutual interest within the context of animal health contingency planning.

A special thank shall be addressed to all the speakers for the well prepared presentations, the chairmen managing competently the different sessions and to all the participants for active contributions to the success of the seminar. It is the hope of the Nordic-Baltic veterinary Contingency Group that many valuable networks have been established for the future work associated with animal disease preparedness and contingency planning.

The seminar could not have been conducted with success without the valuable support given by Dr. Māris Balodis, the Chief Veterinary Officer of Latvia and the staff of the Latvian Food and Veterinary Service (FVS).

Annexes

Annex 1. Seminar programme

Table 1: Programme for the Seminar Contingency Planning – focus on: vaccination, animal welfare, wildlife and costs.

Held on: 3-4 October 2018. Place: Hotel Pullman, Riga Old Town, Jekaba Iela 24, 1050 Latvia.

Day 1	
08:30–09:15	Registration of participants
09:15	Opening session <i>Dr. Edvīns Oļševskis, Deputy Director Of Veterinary Surveillance Department, FVS, Latvia</i> <i>Dr. Siri Lødtvedt, Norway, President of the Nordic-Baltic Veterinary Contingency Group</i>
09:30	Session I: Vaccination – vaccines and vaccination programmes <i>Chair: Dr. Edvīns Oļševskis, Latvia</i> <i>Reporter: Hanna Lounela, Finland</i>
09:30	Vaccines and vaccination against exotic animal diseases 2018 <i>Speaker: Professor Anette Bøtner, DTU, Denmark</i>
10:15	Emergency vaccination with special reference to Lumpy skin disease <i>Speaker: Dr. Alexandra Miteva, Bulgaria</i>
11:00	Coffee break
11:20	Control of influenza in a One Health perspective – do we have the tools and are they used properly? <i>Speaker: Professor Lars E. Larsen, DTU, Denmark</i>
12:05	Questions and discussion related to Session I
12:15	Session II: Animal welfare during disease outbreaks– legislative and practical aspects <i>Chair: Dr. Anna Huda, Denmark</i> <i>Reporter: Thomas Svensson, Sweden</i>
12:15	Stamping-out during foot and mouth disease emergency situations and animal welfare <i>Speaker: Dr. Fred Landeg, UK</i>
13:00	Lunch
14:00	Continuation of session II
14:00	Ensuring animal welfare during depopulation for disease control in the Nordic-Baltic countries <i>Speaker: Dr. Hanna Lounela, Finland</i>
14:40	Questions and discussion related to Session II
15:00	Session III: Wildlife – a reservoir for animal and zoonotic diseases <i>Chair: Dr. Maarja Kristian, Estonia</i> <i>Reporter: Anna Huda, Denmark</i>
15:00	African swine fever in wildlife: lessons learned <i>Speaker: Dr. Paulius Busauskas, State Food and Veterinary Services, Lithuania</i>
15:45–16:00	Coffee break
16:15–17:15	Optional guided walk
19:00	Dinner
Day 2	
08:30	Continuation of session III <i>Chair: Dr. Maarja Kristian, Estonia</i> <i>Reporter: Anna Huda, Denmark</i>
08:30	Wildlife and vector-borne diseases <i>Speaker: Dr. René Bødker, DTU, Denmark</i>
09:10	Viral infections emerging from wildlife: <i>Speaker: Dr. Olli Vapalahti, Finland</i>
09:45	Coffee break
10:05	Chronic wasting disease (CWD) in wildlife <i>Speaker: Dr. Kristin Ruud Alvseike, Norwegian Food Safety Authority</i>
10:30	Questions and discussion related to Session III

Day 2	
10:45	Session IV: Costs – biosecurity and outbreaks Chair: Dr. Sigríður Gísladóttir, Iceland Reporter: Paulius Busauskas, Lithuania
10:45	Costs of biosecurity at farm level – a good investment Speaker: Dr. Lisbeth Harm Nielsen, Danish Agriculture and Food Council
11:15	An epidemiological and economic model analysis of Foot-and-mouth disease outbreaks in the Netherlands Speaker: Dr. RHM (Ron) Bergevoet, Wageningen University; the Netherlands
12:00	Lunch break
13:00	Continuation of session IV
13:00	Analysis of costs caused by an avian influenza outbreak in Denmark Speaker: Dr. Sten Mortensen, The Danish Veterinary and Food Administration
13:35	Analysis of costs caused by African swine fever in domestic pigs and wild boar in Latvia Speaker: Dr. Edvīns Oļševskis, Food and Veterinary Services, Latvia
14:10	Questions and discussion related to sessions day 1 and day 2
14:30	Conclusions and recommendations Chair: Dr. Siri Løtvedt, Norway Reporter: Jørgen M. Westergaard, Adc-Consult, Denmark
14:45	Closing session

Annex 2. The Organizing Committee

The organizing committee established by the Nordic-Baltic Veterinary Contingency Group for the preparation and conduct of the Seminar on Contingency Planning – focus on vaccination, animal welfare, wildlife and costs consisted of:

- Siri Løtvedt, Mattilsynet, Norway – President of the Nordic-Baltic Veterinary Contingency Group
- Edvīns Oļševskis, Food and Veterinary Service, Latvia
- Maarja Kristian, Veterinary and Food Board, Estonia
- Anna Huda, Danish Veterinary and Food Administration, Denmark

The work of the Committee was in the Technical Secretariat assisted by staff from the Food and Veterinary Service, Latvia.

Annex 3. Evaluation

An evaluation form was a part of the handouts given to all participants at the time of registration. The main purpose of distributing the form to the participants was to obtain immediate reaction of participants to the overall concept of the seminar through observations, comments and furthermore to obtain proposals for future N-B VCG activities.

The participants were asked the following questions for observations, comments and proposals:

1. What would you consider as the most valuable “Take home message” from the Seminar?
2. What proposals do you have for future activities within the area of contingency planning?
3. Any comment you find relevant for the future work of the Nordic Baltic Veterinary Contingency Group.

Feedbacks

The distributed form was completed by 19 participants. In general, the comments referred to a well prepared and very well implemented seminar with excellent presentations and discussions on issues important for veterinary contingency planning.

With regard to future activities a few topics were mentioned including:

- Simulation exercises;
- The Animal Health Law – how to bring it in to practice;
- Implementation of seminar recommendations;
- Seminars having some time allocated to workshops to enhance interaction between participants;
- The One Health concept.

Annex 4. Participants

The seminar had 76 participants coming from 12 different countries; Bulgaria, Denmark, Estonia, Finland, Greenland, Iceland, Latvia, Lithuania, Norway, Sweden, the Netherlands and the United Kingdom. Information on the public administrations, organizations and private sectors represented at the seminar is shown in the table 2 below.

Table 2: Public administrations, organizations and the private sector represented at seminar in Riga, 2018

Country	National Veterinary Administrations, Ministries	University and Laboratories	Private Sector; Livestock others	National Veterinary Associations	Total
Bulgaria	1				1
Denmark	14	7	2		23
Estonia	5	1			6
Finland	8	1			9
Greenland	1				1
Iceland	1				1
Latvia	8	3			11
Lithuania	4				4
Norway	5	5	2	1	13
Sweden	4		1		5
The Netherlands		1			1
The United Kingdom			1		1
Total	51	18	6	1	76

The veterinary administrations of all Nordic and Baltic countries have prepared contingency plans for a number of exotic animal diseases. The distribution of participants as shown in table 2 reflects to a great extent that the legal requirements for developing and implementing of contingency plans rest with national veterinary administrations and national reference laboratories.

Annex 5. Organization chart

The activities of the Nordic-Baltic Veterinary Contingency Group (N-B VCG) are carried out within the framework of allocations given to Nordic working group for microbiology and animal health/animal welfare.

Figure 1: Nordic working groups under MR-FJLS

Annex 6. Publications prepared by the Nordic-Baltic Veterinary Contingency Group

The Nordic-Baltic Veterinary Contingency Group has since 2007 published a number of documents on different aspects of contingency planning within the area of animal health. Information on the publications published by the Nordic Council since 2013 is shown in the table below.

Table 3: Publications published since 2013

Year	Name of document
2018	Exercise Pegasus 2017; Report on an African horse sickness simulation exercise conducted in 2017 and involving Denmark, Estonia, Finland, Iceland, Latvia, Lithuania, Norway and Sweden TemaNord 2018:526
2017	Nordic Veterinary Contingency Planning; Report on activities to prevent exotic animal diseases entering the Nordic-Baltic Countries TemaNord 2017:571
2017	Animal Health Contingency Planning; The proceedings of a Seminar on Animal Health Contingency Planning in the Nordic Baltic Countries, 12–13 October 2016, Vilnius, Lithuania. TemaNord 2017:539
2016	Biosecurity and livestock production. The proceedings of a Nordic-Baltic seminar on biosecurity highlighting experiences gained in livestock production, and future challenges with special reference to motivation, training and economic aspects, 6–8 May 2014, Rimbo, Sweden TemaNord 2016:504
2015	TROUT 2013 – simulating VHS outbreaks: Report on Exercise TROUT 2013 – Implementation of and activities related to a Viral Haemorrhagic Septicaemia (VHS) simulation exercise for the Nordic and Baltic Countries conducted 4–5 December 2013, Bergen, Norway Tema Nord 2014:571
2014	Wildlife and Infectious Animal Diseases The Proceedings of a Nordic–Baltic seminar on the role of the wildlife as reservoir and/or spread of infectious animal diseases in the coastal areas of countries bordering the Baltic Sea 2–3 October 2013, Gdansk, Poland Tema Nord 2014:508
2014	Contingency Planning for Animal Diseases The Proceedings of a Nordic-Baltic Seminar on “Contingency Planning for the next Decade” held 19–20 September 2012 Helsinki, Finland Tema Nord 2014:509 I
2013	Operational Expert Groups for Animal Diseases Report on Ad-Hoc meeting on the operational expert groups for animal diseases: How to maintain expertise? Copenhagen, 3–4 December 2012 Nordic Working Papers NA2013:926

All publications prepared by the Nordic-Baltic Veterinary Contingency Group and published by the Nordic Council are available on: www.norden.org/nordpub.

Nordic Council of Ministers
Nordens Hus
Ved Stranden 18
DK-1061 Copenhagen K
www.norden.org

Veterinary Contingency Planning

Veterinary contingency planning in the Nordic-Baltic countries aims to prepare national veterinary administrations and stakeholders to respond speedily and effectively to an emergency situation caused by highly contagious trans-boundary viral diseases such as avian influenza, foot and mouth disease, and African swine fever. Diseases having a disastrous impact on the livelihood of people working in the livestock sector and related industries.

The Nordic and Baltic countries have by and large adopted very similar guidelines for the development of animal health contingency plans; guidelines based on the four pillars: disease prevention, preparatory arrangements, response and recovery.

This report contains information on the conduct of a Nordic-Baltic seminar and the recommendations adopted by the seminar participants; the seminar had focus on vaccination, animal welfare, wildlife and costs.

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