NORDIC VETERINARY CONTINGENCY PLANNING

Report on activities to prevent exotic animal diseases
entering the Nordic-Baltic Countries

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Jørgen M. Westergaard and Anna Huda

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Contents

Preface	7
Seminar on Risk Analysis	9
Editorial Preface	10
Acknowledgements	11
Executive summary and recommendations	11
Program	13
Opening speech by Director general Guri Tveito – Ministry of Agriculture and Food of Norway	15
Abstracts from speakers	17
List of participants including the speakers	30
The organising committee	32
Nordic-Baltic Bluetongue Simulation Exercise “HOT-AIR”	33
Executive Summary	34
Introduction	35
Aim	35
Objectives	36
Bluetongue – an emerging disease	37
The scope of the Nordic-Baltic Bluetongue simulation exercise	41
Inter-Nordic-Baltic scenario for simulation exercise	42
Scenarios for individual countries for simulation exercise	42
Implementation	43
Evaluation	43
Acknowledgements	47
References	47
Seminar on the Importance of Vectors in the Spread of Animal Disease Today and in the Future	49
Editorial preface	50
Acknowledgement	51
Conclusions and recommendations	51
Programme for the vector seminar	54
Abstracts from invited speakers	56
Evaluation	72
List of participating experts	74
The organizing Committee	75
Seminar on National Contingency Plans and Response to Animal Disease Emergencies	77
Editorial preface	78
Acknowledgement	79
Conclusions and recommendations	79
Programme for the Seminar on National Contingency Plans and Response to Animal Disease Emergencies	82
Abstracts from invited speakers	85
List of participating experts	102
The organising committee	104

Nordic-Baltic Seminar on Risk Based Animal Health Surveillance and Contingency Planning .	105
Editorial preface	106
Acknowledgement	107
Observations and Conclusions	107
Recommendations	108
Programme for the seminar Nordic-Baltic Seminar on Risk Based Animal Health Surveillance and Contingency Planning.....	109
Target group	110
Abstracts from invited speakers	113
Evaluation	149
The organizing Committee	151
Report on the workshop: Strengthening and adaption of the preventive measures to existing risks of African swine fever introduction from Eastern neighbouring countries to Nordic- Baltic Region	153
Report of the workshop.....	154
Conclusions of the workshop	158
List of participants	160
Workshop	161
Publications prepared by the Nordic-Baltic Veterinary Contingency Group 2012–2017	163
Sammendrag	165

Preface

A strategy plan including cooperation within Nordic-Baltic veterinary contingency planning was adopted in 2006 by the Nordic Council of Ministers. The plan had the goal to maximize the potential of Nordic/Baltic cooperation and work together to prevent and combat serious contagious animal diseases such as foot and mouth disease, avian influenza, classical swine fever, Newcastle disease and any other animal diseases, including zoonoses. The strategy plan resulted in the creation of the Nordic-Baltic Veterinary Contingency Group (N-BVCG) which since the start in 2006 has worked on the objectives:

- 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 diseases crises;
- to increase awareness among professionals and stakeholders within the region regarding animal health threats and emerging disease.

To comply with the objectives the N-BVCG has in particular carried out work resulting in:

- *International seminars*: the topics have included risk analysis, vector borne diseases, risk based surveillance and contingency planning; wildlife and infectious animal diseases, biosecurity
- *International simulation exercises covering the following diseases*: foot and mouth disease, bluetongue, West Nile fever, African swine fever and viral haemorrhagic septicaemia
- *Workshops covering*: Preparation of simulation exercises, animal expert groups, rapid qualitative risk assessments for use in National veterinary administrations and communication.

In this publication the Nordic-Baltic Veterinary Contingency Group (N-BVCG) presents a selection of reports and proceedings not previously made available to readers of publications issued by the Nordic Council of Ministers. Publications which highlight the importance of animal disease prevention, diseases preparedness and that it is vital to detect an exotic disease as soon as possible and before it spread in one or more of the Nordic Baltic Countries.

The Members of the N-BVCG would like to express their thanks to the Nordic Council of Ministers for the political and the financial support made available work on contingency planning; globalization, global warming ,rapid changes in livestock production, better diagnostic tools and vaccines calls for close cooperation as diseases do not respect man made borders. The strategy plan adopted in 2006 by the Nordic Council of Ministers is still very valid.

Seminar on Risk Analysis

Seminar on Risk Analysis: Risk Assessment, Risk Management and Risk Communication with special reference to infectious animal diseases. In Oslo, Gardermoen, 3–4 December 2007.

Abstract: An important tool in coordinating resources and knowledge during “peacetime” and emergency situation is Risk Analysis. The seminar enhanced with regard to contingency planning the importance of risk assessments, risk management and risk communication.

Seminar on Risk Analysis	9
Editorial Preface	10
Acknowledgements	11
Executive summary and recommendations.....	11
Program	13
Opening speech by Director general Guri Tveito – Ministry of Agriculture and Food of Norway	15
Abstracts from speakers	17
List of participants including the speakers	30
The organising committee	32

Editorial Preface

Due to geography, history, communication, trade etc., the Nordic and Baltic countries comprise a region where coordinated efforts may reduce negative consequences of animal diseases. With the aim to retain the status in relation to serious contagious animal diseases and zoonoses the Nordic-Baltic ministers responsible for animal diseases and zoonoses want to strengthen the veterinary contingency planning in the region. Generally, the needs to focus on emerging diseases also have been emphasised.

On 7 November 2006 the Nordic Council of Ministers adopted a strategy plan which included cooperation within Nordic-Baltic veterinary contingency planning.

A veterinary contingency group, which is the organising committee of this seminar, has been established. The working program of this group is primarily related to coordination of training programs and the arrangement of courses, seminars and simulation exercises.

Risk analysis is an important tool in coordinating resources and knowledge both during crises and peacetime. It is important to establish a common understanding in using this tool. Cooperation and communication therefore, are necessary in order to come to the best results in the various situations which are different from one time to another.

One of the objectives of this seminar was to enhance understanding, cooperation and communication between persons and institutions engaged in risk assessment, risk management and risk communication. Therefore, we hope that the seminar both has given an opportunity for interesting professional discussions and has proved to be an event for creating individual and institutional relations.

Oslo, 15 December 2007

On behalf of the organising committee

Eivind Liven

Acknowledgements

The organising committee (the committee) wants to thank the Nordic Council of Ministers for their financial support to the seminar. This has facilitated the arrangement in general and additionally made it possible to engage skilled and experienced speakers to introduce the various aspects of the risk analysis process in a comprehensive way.

The committee also wants to thank the relevant ministries in the Nordic-Baltic region for the support in coordinating animal disease control work in the region. Special reference is made to the motivation for further work on Nordic-Baltic level as expressed by the representative of the Ministry of Agriculture and Food in Norway at the opening of the seminar.

The committee wants to express their gratitude to the speakers for their excellent presentations and their ability to generate discussions and dialog during the seminar. Furthermore the committee is most thankful to the attendants who, based on their knowledge and practical experiences made the seminar a forum for discussions and exchange of opinions.

Executive summary and recommendations

During the last decade a number of serious outbreaks of infectious animal diseases have occurred on the European continent. Among these outbreaks also new diseases (emerging diseases) have been experienced. The overall costs for the society related to the control of these outbreaks are great. European countries are at present experiencing a new situation related to the rapid spread of Blue-tongue.

Risk analysis is an important tool for taking adequate actions to control infectious animal diseases. Applied correctly the risk analysis elements will work synergetically to limit the consequences for the society both in terms of public health, animal health and welfare and economics. Likewise, risk analysis is an important tool for medium and long term strategy and contingency planning in the animal and public health sector.

The first day of the seminar focused on the principles of risk analysis while on the second day the application of the various disciplines of risk analysis, including emerging diseases and training, were discussed. Approximately 100 persons, coming from animal and food authorities, relevant scientific institutions and the private sector, attended the seminar. All Nordic and Baltic countries were represented.

The seminar showed that it is necessary to have a closer cooperation between people and institutions involved in the various parts of risk analysis work. It was emphasised that all actors were dependent on each other and that internal communication is a prerequisite for a successful outcome. Strong and formal barriers between the elements of risk analysis, therefore are considered to be a hindrance for a constructive risk analysis process.

While dialog between individuals and institutions involved is necessary to understand and express the risk possibly at hand, the decision as to which, measures

that should be taken will be the full responsibility of the risk manager. The risk manager at authority level has the responsibility to communicate with the political level.

The seminar showed that there is a great need for training programs which simultaneously involve risk assessors as well as risk managers. Such programs should include risk communication as an important element. Economics should also be part of the agenda. It was expressed that it is relevant to develop the work on risk analysis issues which has been established on the Nordic-Baltic level.

Based on the abovementioned reflections the following recommendations, as amended after plenary discussions during the closing session of the seminar, were made.

The use of risk analysis in the veterinary sector

- Draft risk assessments in the area of animal health and public health prepared by countries situated in the Nordic-Baltic region should be made available for comments from:
 - all other Nordic and Baltic countries affected by the risk analysis
 - international peer review before becoming final
- Exception may be given to assessments prepared for publication in scientific journals:
 - A dialogue forum should be established where Nordic and Baltic risk assessors, risk managers and risk communicators can meet and discuss current problems and encourage cooperation in these areas.

Training in risk analysis

- Risk analysis is an important tool in contingency planning and efforts should be made to facilitate training in the Nordic-Baltic region in the use of risk analysis and creation of networks for sharing experiences, especially with a focus on countries that have limited resources;
- The guidelines for risk analysis published by the World Organisation for Animal Health (OIE) and by the Codex Alimentarius Commission (Codex) should be used as teaching material in common Nordic-Baltic training programs;
- Support should be formed for the OIE collaboration center in Copenhagen to carry out training activities in risk assessment, risk management and risk communication for the Nordic-Baltic countries as well as “external” participants;
- In training programs drawn up for risk analysis work in the veterinary sector the discipline of animal health economics should be an integrated part, whenever possible;
- Training in risk analysis is for example offered as one-week-long course in the Master of Veterinary Public Health program, Faculty of Life Science, University of Copenhagen (the former Royal Veterinary and Agriculture University).

Communication

- During all activities related to the application of risk analysis work special attention should be paid to communication during the internal process as well as addressing the public. A risk communication strategy should be put in place at the start of each risk analysis;
- All countries in the Nordic-Baltic region conduct simulation exercises for exotic and potential emerging diseases. The communication issues should be included in such exercises;
- A close cooperation and communication between Chief Veterinary Officers (CVO) and other relevant animal health authorities and decision makers at policy level is vital for disease control.

Program

Seminar on Risk Analysis: Risk Assessment, Risk Management and Risk Communication with special Reference to infectious Animal Diseases.

Objectives of the seminar

To enhance the understanding, cooperation and communication between persons/institutions engaged in risk assessment, risk management and risk communication.

Target group

Persons/institutions in the Nordic and Baltic countries involved in risk assessments, risk management and risk communication within the area of animal health.

Table 1: Agenda

Time	
Day 1	
12:00–13:00	Lunch
<i>Session 1:</i>	<i>Chairman Eivind Liven; Norway</i>
13:00–13:15	Opening of the seminar
	Director general Guri Tveito from the Ministry of Agriculture and Food of Norway.
13:15–14:00	Paper 1
	Risk assessments in the veterinary sector with regard to animal health
	<i>Speaker: Marion Wooldridge; UK</i>
14:00–14:15	Discussion
14:15–15:00	Paper 2
	Risk management: The use of risk assessments in the veterinary sector
	<i>Speaker: Preben Willeberg; Denmark</i>
15:00–15:15	Discussion
15:15–15:45	Coffee break
15:45–16:30	Paper 3
	Risk communication
	<i>Speaker: Helga Odden Reksnes; Norway</i>
16:30–16:45	Discussion
16:45–17:30	Paper 4
	Risk analysis in animal health; OIE guidelines on setting animal health import measures
	<i>Speaker: Gaston Funes; OIE</i>
17:30–17:45	Discussion
17:45–18:00	Closing session
Day 2	
<i>Session 2:</i>	<i>Chairman Kristine Lamberg; Latvia</i>
08:30–09:15	Paper 5
	What are the training needs for persons involved in animal health and public health in the area of risk analysis?
	<i>Speaker: Ivar Vågsholm; Sweden</i>
09:15–09:30	Discussion
09:30–10:00	Paper 6
	The approach to risk analysis in Lithuania
	<i>Speaker: Gediminas Pridotkas; Lithuania</i>
10:00–10:15	Discussion
10:15–10:45	Coffee break
<i>Session 3:</i>	<i>Chairman Audur Lilja Arnthorsdottir; Iceland</i>
10:45–11:15	Paper 7
	Risk assessment of exotic and emerging diseases in Finland
	<i>Speaker: Heidi Rosengren, Finland:</i>
11:15–11:45	Paper 8
	Risk assessment of exotic and emerging diseases in Sweden, with special reference to Bluetongue
	<i>Speaker: Ann Lindberg, Sweden</i>
11:45–12:00	Discussion
12:00–13:00	Lunch
<i>Session 4:</i>	<i>Chairman Raimond Strastin; Estonia</i>
13:00–13:30	Paper 9:
	Emerging diseases in the last decade, short review
	<i>Speaker: Jørgen Westergaard; Denmark</i>
13:30–13:45	Discussion
<i>Session 5:</i>	<i>Chairman Eivind Liven; Norway</i>
13:45–14:45	Conclusions and recommendations
14:45–15:00	Closing the seminar

Opening speech by Director general Guri Tveito – Ministry of Agriculture and Food of Norway

Reforms in European food governance

As you all recall – in the 1990s we had several international food and animal health crisis. In Europe there were initiated comprehensive reforms with the aim to handle these challenges. It was necessary to:

- improve food safety;
- ensure a high level of consumer protection;
- restore and maintain confidence in the food supply;
- enhance the ability of the authorities to cope with food safety issues.

The reforms focused on four major needs:

- the need to have a clear separation of tasks between the scientists on one hand performing risk assessment and the managers on the other hand considering risk management;
- a need to bring regulators closer to the public and the operators;
- simplification of the legal framework;
- the need to have a clear chain of command and clear constitutional responsibilities along the entire food chain, from primary production to product delivery.

The benefit of Nordic-Baltic cooperation

Due to similarities in geography, climate, communication, trade etc., the Nordic and Baltic countries comprise a region where coordinated efforts may reduce negative consequences of animal diseases.

We all have a clear objective to retain the status in the region in relation to serious contagious animal diseases and zoonoses. The Nordic-Baltic ministers have agreed to strengthen the veterinary contingency planning in the region. Generally, the need to focus on emerging diseases, like Bluetongue, has also been expressed.

The Nordic Council of Ministers amended in November 2006 a Strategy Plan with four strategies to reach principle goals in the area of contingency planning:

- to establish communication channels;
- to exchange experiences and knowledge;
- to ensure that actions taken should be as uniform and harmonious as possible;

- to communicate with the public in the most possible uniform way. This is a challenge both within each country and between countries.

This seminar is a contribution to fulfil this resolution.

Why do we need risk analysis?

Risk analysis must form the foundation on which we build our food safety policy.

The food policy must be based on the application of the three components of risk analysis:

- risk assessment (scientific advice and information analysis)
- risk management (regulation and control)
- risk communication

The objective of risk assessment is to provide scientific advice. Extensive collection of information and analysis is a prerequisite for sound and up-to-date scientific advice.

An important lesson from prior food crises is that there must be a clear separation between risk management and risk assessment. This is vital to maintain consumer confidence in the long run. Risk communication is a key element to ensure that consumers are kept informed. It requires scientific knowledge to be made widely and rapidly available. In addition, consumers need to be provided with easily accessible and understandable information. And this is an area where we all can improve.

Risk analysis is an important tool in coordinating resources and knowledge both during crises and in peacetime. The approach to the application of this tool might differ from one country to another. It is important to establish a common understanding in using this tool. This is clearly expressed in the Strategy Plan for Cooperation within veterinary contingency planning in the Nordic-Baltic countries.

Objective

The objective of this seminar is to enhance understanding, cooperation and communication between persons and institutions engaged in risk assessment, risk management and risk communication.

The organising committee has put together an interesting programme going deeper into these topics. It comprises presentations of both general and specific relevance for the region. The speakers come from countries and institutions outside (like the OIE and UK) as well as inside the Nordic-Baltic region. I would like to thank all the Nordic-Baltic members of the committee for their valuable contributions.

The benefit of this seminar is not only the presentation of professional facts and exclusive skills, maybe even more important is the establishment of personal contacts and relations. Only the connections made in peace-time will be truly useful in crises.

Abstracts from speakers

Risk assessment in the veterinary sector

By Professor M. Wooldridge – Veterinary Laboratories Agency (Weybridge), UK

A risk assessment is the assessment of a risk – and we all do it every day. However, for a formal risk assessment in the sphere of animal health and veterinary public health, there are certain criteria which it is usually necessary to meet, and these will be outlined. There are two major sets of guidelines in use in the field, that in the OIE Animal Health Code, which refers to the importation of animals and their products, and Codex, from the WHO, which refers mainly to food products, including those of animal origin. However, for each system, risk assessments undertaken may be qualitative, quantitative, or semi-quantitative. Both sets of guidelines, and their translation into risk assessment methodologies will be reviewed, with examples each of qualitative and quantitative risk assessments. Finally, the relationship between risk managers will be examined, with pitfalls and recommendations for effective working relationships proposed.

Risk management: The use of risk assessment in the veterinary sector

*By Professor Preben Willeberg – Center for Animal Disease Modeling and Surveillance,
University of California, Davis, USA*

This presentation attempts to describe how a risk manager of animal health related matters may see the importance, needs and problems with the past and current procedures and applications of risk assessments in Europe, and in particular in the Nordic countries.

General considerations on the aims and requirements for risk assessments to be of value to risk managers are outlined, and some examples are given on how the process may be improved to overcome some potentially significant problems and to lead to better decisions being made.

The important differences in terms of the influential factors on the assessment and the management, respectively, are pointed out, and the dangers of over-stepping the boundaries are emphasized and exemplified. Different sets of guidelines on how to carry out risk assessments are discussed.

The risk analysis process is complicated and prone to go wrong in various aspects. Examples of this will be discussed.

Different application areas for risk assessment include design of risk-based surveillance systems, justification for preventive actions, evaluation of alternative control activities, and documentation of current disease situations in neighboring countries.

Current and recent examples from Danish experience within the EU as well as among the Nordic countries will be discussed to demonstrate some common pitfalls and to suggest how to minimize or avoid them. However, some are inherent to the applications and the way in which the risk assessments come about, and therefore we should all be aware of them and at least understand how to live with them, or if possible on how to come to more a general agreement on minimizing the impact of these weaknesses.

The examples chosen for more detailed discussion relate to:

- obtaining negligible risk status within the EU for trichinella in Danish pork, including how to establish a risk-based surveillance system to match that status;
- risk assessments to prepare discussions on the rabies and echinococcus requirements in the revision of the EU Regulation on the non-commercial movement of pet animals.

Problems arising from implications to different countries with different status, different risk assessment agencies (national, EFSA), different scientific disciplines and "schools", etc. will be highlighted.

Risk communication

By Helga Odden Reksnes – independent risk communication expert and Jorun Jarp – Deputy Director of Animal Health at National Veterinary Institute

Due to world trade and the increasing global traffic of people and animals, the animal health situation is becoming more and more global. Decisions related to import policy, handling of outbreaks of infectious animal diseases and contamination of animal products have to be made with uncertainty, are often based on complex scientific knowledge and requires involvement from many different interested parties. The trust in the decisions made will be dependent on both the scientific quality of the risk analysis and of the process itself- how risk communication has been integrated into the various stages of risk assessment and risk management. Furthermore, an important assumption for the globalisation is the possibility to communicate fast and extensively regardless of national borders, culture and language barriers.

During the last 20 years, risk analysis has slowly emerged as a technical and practical tool. Risk analysis has become a potentially strong framework for managing risks both on a global and local level. Risk analysis is also being used as hard evidence in the trade courts and in negotiations between buyer and seller. The logics and steps of risk analysis are applied during a crisis. As part of a preparedness strategy, to meet the threat of emerging diseases, the risk analysis framework offers a global and scientific approach. Nobody disputes the presence of risk communication as an integral part of the risk analysis. This is demonstrated in various models and definitions related to risk analysis. A proper and fully recognised member of the risk analysis family. How do we go from an ad hoc approach to a truly integrated approach? And how do we achieve optimal support and accept?

The challenges, motivations and effects of risk communication are discussed in relation to four relevant animal health cases; import risk analysis related to BSE, the E.coli-outbreak in Norway in 2006, Avian Influenza and Bluetongue. The outcome is tentatively captured in a Risk Communication Matrix. A structured and professional approach to risk communication requires analysing the issue and situation, identifying critical communication points, deciding on strategy and networking policy and establishing a good risk communication practice. And finally, adequate resources must be allocated to implementing the risk communication measures.

Risk communication deserves further investigation and development within the risk analysis framework. Future work should focus on sharing knowledge and experiences in a multidisciplinary environment, early warning systems, common measures related to environmental scanning and developing best practices related to strategic risk and crisis communication.

Applied properly and consistently, risk communication establishes a common playground for the parties involved, distributes knowledge and opinions effectively among the various stakeholders, clarifies roles and responsibilities, builds trust and ensures fair play. The ultimate aim of risk communication is to reach an optimal risk

management decision and optimal support for and accept of the risk management decision. In spite of positive signals, risk communication is still awaiting its realisation as a proper and fully recognised member of the risk analysis family. How do we go from an ad hoc approach to a truly integrated approach? And how do we achieve optimal support and accept?

The challenges, motivations and effects of risk communication are discussed in relation to four relevant animal health cases; import risk analysis related to BSE, the E. coli-outbreak in Norway in 2006, Avian Influenza and Bluetongue. The outcome is tentatively captured in a Risk Communication Matrix. A structured and professional approach to risk communication requires analysing the issue and situation, identifying critical communication points, deciding on strategy and networking policy and establishing a good risk communication practice. And finally, adequate resources must be allocated to implementing the risk communication measures.

Risk communication deserves further investigation and development within the risk analysis framework. Future work should focus on sharing knowledge and experiences in a multidisciplinary environment, early warning systems, common measures related to environmental scanning and developing best practices related to strategic risk and crisis communication.

Risk analysis in animal health OIE Guidelines on setting animal health import measures

By Dr Gaston Funes – Deputy Head of the OIE Regional Activities Department

The OIE is the International Standard Setting Organisation (ISSO) recognised by the World Trade Organization (WTO) Agreement on the Application of Sanitary and Phytosanitary Measures (the SPS Agreement) as the reference organisation for animal health issues. Among its objectives, and within its mandate under the SPS Agreement (to ensure safe international trading of animals and products), the OIE develops, publishes and promotes international animal health standards, guidelines and recommendations (*OIE Codes*).

The SPS Agreement allows WTO Member Countries two options in setting health measures. The first option, strongly encouraged by the SPS Agreement, is for member countries to base their health measures on OIE international standards (OIE Codes). In the absence of a relevant standard or when a member country adopts a higher level of protection than that provided by the OIE standard, a second option can be applied, based on scientific risk analysis to determine whether importation of some commodities poses a significant risk to human or animal health and, if so, what health measures could be applied to reduce that risk to a level acceptable to the importing country.

For this purpose, the OIE Terrestrial Code includes chapters containing sanitary measures for risk mitigation for specific diseases and other chapters with general guidelines which should be taking into account when Member Countries carry out a risk analysis. These guidelines include the following topics: Import Risk Analysis; Evaluation of Veterinary Services; Zoning and Compartmentalisation; Equivalence of Sanitary Measures. The OIE has also developed a Handbook on Import Risk Analysis for Animals and Animal Products to give Member Countries a framework for the risk analysis process, based on the Code, to ensure that risks posed by imported commodities are identified and managed effectively.

The purpose of import risk analysis is to assess disease risks objectively and transparently so that the transfer of pathogenic agents is avoided, sanitary measures can be scientifically justified and trade restrictions are minimised.

For the purposes of conducting an import risk analysis, as well as for establishing import sanitary measures, trading partner countries can get reliable and up-dated information on the sanitary situation for relevant animal health diseases from the World Animal Health Information Database (WAHID). Member countries must notify the OIE of the occurrence of such diseases or the detection of any evidence of infection.

The list of countries or zones considered to be “free from” some diseases is also available from the OIE, which establishes science-based criteria for determining such a free status. From the OIE disease list, the free status of four diseases (FMD, BSE, Rinderpest and Contagious Bovine Pseudo-pneumonia) is officially recognised by the OIE under specific procedures adopted by its member countries. For the other diseases, even when there is no specified official recognition from the OIE, guidelines and criteria for achieving the

free status are included within specific chapters of the OIE Code, and concerns of trading partners need to be addressed.

Even when applying health measures from the Code, some form of risk analysis may still be necessary to ensure a sound framework that combines the hazards (pathogens) related to the commodity, the disease statuses of both trading countries, and the recommendations in the Code. Therefore, the import health measures determined as a result of the risk analysis process may be a combination of the recommendations in the Code and additional measures imposed by the importing country.

Finally, when trading, countries should agree on a health certificate, the requirements of which should be exact and concise, and clearly reflect the agreed positions of the trading partners. The whole process should be very transparent; therefore, the exporting country is obliged to give the importing country all necessary information, including results of previous risk assessments, and should allow the importing country to evaluate its Veterinary Services. The importing country should not require import health measures that give a level of protection higher than those applied internally, and the international veterinary certificate should not include measures for the diseases which are present in the importing country and are not subject to an official control programme.

All import health measures, i.e. those from the OIE Code or additional ones imposed by the importing country as a result of the risk analysis, should be science-based in order to avoid unjustified trade restrictions.

Training needs for persons involved in animal and public health in the area of risk analysis

By Ivar Vågsholm – Adjoint professor in epidemiology at the Swedish Agriculture University and associate professor at National Veterinary Institute

The training needs for risk analysis in animal and public health should start with the one medicine concept there is one human, veterinary and environmental medicine not three different disciplines. Since there is different understanding of the concept of risk and risk analyses, that is one need for persons involved in risk analysis to be multicultural.

There are different conceptions of risk. This is crucial when communicating risk analysis conclusions to the general public, decision makers and scientists. Risk is defined as consequence times a probability in the risk analysis context. However, the general public is more concerned with consequences than with probabilities. In the epidemiology context risk refers to the probability of disease or injury. In the financial world it is the expected standard deviation of an economic outcome of a project or value at risk. The aim of the lecture is to suggest ways of ensuring people hear what you say.

In the food safety domain (Codex Alimentarius) the current dogma is the strict separation of risk assessment and management while communication is a respective responsibility. Risk assessment should not be bothered by acceptability, economic considerations or the use of the precautionary principle. One of the reasons was the BSE crisis within the EU where the general public lost confidence in the risk assessment bodies and it was revealed that the independence of these bodies could be questioned. The strict separation of risk management and assessment became geographical when the new European Food Safety agency was located in Parma, Italy 2004 while the risk management remained in Brussels. The experience shows that this strict separation is unpractical and creates difficulties. The preparatory work such as development of risk profiles, formulating the risk questions to be addressed is hampered, just by physical separation. Furthermore, the exchange of information, clarification of questions during the risk assessment is hampered. A new approach based on strict separation of tasks and responsibilities while close collaboration on the preparatory work and during assessment seems to be more efficient in terms of consumer protection.

In the animal health the separation of risk assessment and management is different according to the OIE (World Animal Health Organisation) outline. Hazard identification is a risk management task and the outcome risk estimate should be compared with the risk mitigation (management) measures for assessing their proportionality. In essence this is a variant of benefit cost analysis.

In public health there is no distinction between risk assessment and risk management. For example during the Norwegian E. coli outbreak the risk assessor felt compelled to inform the general public and other stakeholders about how they should manage the risk represented by food stuffs.

The approach to risk analysis in Lithuania

By Gediminas Pridotkos – Deputy Director National Veterinary Laboratory, Lithuania

The reorganization of food control institutions in Lithuania was completed in 2000 and the State Veterinary Service, the State Hygiene Inspection and the State Quality Inspection were transformed into the State Food and Veterinary Service (SFVS). One of the responsibilities of the new institution is food control “from stable to table”. It covers animal health, animal welfare, drugs control, external factors, production, transportation, storage and marketing of food for human consumption, etc. All these issues are deeply associated with risk assessment (RA), risk management (RM) and risk communication (RC).

A few years ago RA, RM and RC were under the responsibility of the Department of Risk and Quality Management, the Department of Animal Health and Welfare and the Centre (Department) for Contingencies and Contagious Diseases of SFVS respectively.

In 2007 SFVS delegated the duties to perform RA to the Lithuanian State Inspection on Veterinary Preparations (LSIVP) and the Department of Risk Assessment and Science was established as part of LSIVP. In collaboration with the Lithuanian Veterinary Academy and other scientific institutions this department, based on scientific evidence and undertaken in an independent objective and transparent manner, performs risk assessment in the field of food and feed safety, animal health and welfare. This department also provides conclusions on risk assessment, advises on issues concerning risk management, participates in relevant national and international projects concerning risk assessment and veterinary science, collaborates with EFSA and other competent authorities of EU in third countries and Lithuania on issues concerning risk analysis and veterinary science. The department also provides objective and comprehensive public information on risk assessment and attainments of veterinary science.

SFVS prepare a RA plan for every year. After this plan is ratified it is introduced to LSIVP, which is responsible for the organization of activities according to the approved plan and presentation of results to SFVS.

There are several information sources for the RA in Lithuania. Among them are monitoring programs of SFVS, Statistics Department (statistical data), Ministry of Agriculture (data on trade), Ministry of Environment (data on wildlife), Centre of Rural Business Development and Information (data on animal identification and movements). Very important for the RA activities in Lithuania is the relation to other EU institutions. One of them, BFR Federal Institute of Risk Assessment in Germany, contributed considerably in training and consultation of Lithuanian specialists involved in risk assessment. As a consequence of this collaboration the new institution, the Institute of Risk Assessment, will be established in 2008. This institute will have the functions and responsibilities of the present Department of Risk Assessment and Science of LSIVP.

Assessment of the risk of exotic and emerging diseases in Finland

By Heidi Rosengren – Researcher Department of Risk Assessment, Evira, Mustialankatu 3, 00790 Helsinki. Keywords: risk assessment, risk management, exotic, emerging, animal disease

A risk is the probability and consequences of a hazard (ex. animal disease agent). Risk assessment is the process to measure the probability and consequences of a hazard (ex. animal disease) in a formalized and transparent way. An assessment can be both qualitative and quantitative and the most important difference is that the resulting risk estimate in the quantitative assessment is numerical and includes a measure of the uncertainty.

A challenge for a risk manager in a world of limited resources is to gradually move from hazard based decision making based on hazard identification to a risk based decision making based on formalized and scientifically sound risk assessments.

There is an organisational separation between the risk assessment and the risk management as well as monitoring and surveillance in Finland. The commission of a risk assessment arises from the need of the risk management at the Ministry of Agriculture and Forestry or from within the Evira. Commissions received stems from the need to base the resources and measures of the contingency plans of exotic diseases on the actual probability as well as on the consequences in terms of spread and costs of an outbreak. There is also a need for a scientific base for the Finnish view in EU-animal health policy decisions.

The main risk assessment projects undertaken are exotic diseases such as CSF (release and exposure assessment 2001–2005), BSE (release and exposure assessment 2002–2007), exotic poultry viruses (exposure assessment 2006–2009) and FMD (exposure assessment 2006–2009). Hazard identification projects of VHS in fish (2006–2007) and Bluetongue (2007–2008) has also been commissioned. The paratuberculosis risk in cattle (2002–2003), risk of BVD in imported semen (2003–2004) and the assessment of the allocation of the costs of Newcastle disease management among stakeholders in Finland (2007–2008) are examples of self-tasking assessment undertaken.

A challenge for our assessment projects is always the lack of suitable data (ex. prevalence of disease agent and of risk factors in the population) or the lack of access to existing data. Access to good quality and validated animal population registers is also important but not always fulfilled. Good understanding between veterinary epidemiologists and modellers is a vital part of the assessment process. It is also important to remember that risk communication is a two way affair that facilitates the prioritisation of hazards and correct timing of projects. This in turn enables effective use of risk assessment results. The balance between the national risk assessment tasks and the work on scientific opinions and risk assessments EFSA conducts will also be vital in the future.

Risk managers need both risk assessment as well as assessment of the efficacy of control measures. The combination of these two fields with modern methods of cost-benefit assessment allows for a risk management which is both effective and cost-

effective. With the help of risk assessment the sparse resources can be allocated to the most cost-effective risk management and the motivation of the stakeholders is easier. There will always be a need for hazard based decisions when research bring new light on old hazards or when the world is changing at a rate and in directions that cannot be anticipated. Hazard based decisions should, however, include decisions that facilitates future risk based decisions, ex. prioritisation of research.

Risk assessment of exotic and emerging diseases in Sweden, with special reference to Bluetongue

By Lindberg, A. Epidemiologist: Stenberg Lewerin, S. Associate Professor: Wahlström, H. DVM, PhD Department of Disease Control, National Veterinary Institute, Uppsala, Sweden

The introduction of bluetongue virus (BTV) infected animals into previously uninfected areas poses a risk for establishment of the infection if there are competent vectors in the environment. In Sweden, vector surveillance during 2007 has shown that species of *Culicoides* that have been associated with transmission of bluetongue serotype 8 in north-western Europe are prevalent also in our country. In conjunction with a warmer and wetter climate, it must be regarded as likely that BTV could persist in Sweden, if introduced.

This paper is based on a real case from early 2007, where an importer applied for a permit to import 500 pure bred Texel sheep from the Netherlands. Due to the 2006 developments with respect to bluetongue, the area was under restriction but there had not been any cases at the time when the application was filed. A qualitative assessment was performed by the National Veterinary Institute, suggesting that there was a non-negligible risk of introducing bluetongue with the consignment, and eventually, the importation never took place. Subsequently, during the course of the summer 2007, Texel also became a part of the protection zone. The objective of this paper was to retrospectively explore the risk associated with this potentially hazardous importation as if it had taken place.

We have compared three of five different possible exemptions from the exit ban that are available in the current legislation (Commission Regulation (EC) 1266/2007) for movements during a vector active period. The three options evaluated are; 1) to keep the animals protected against vector attacks for a period of at least 60 days prior to dispatch (Scenario A), 2) to only include animals that have tested positive between -360 to -60 days prior to dispatch (Scenario Bi) and 3) to only include animals that have tested positive between days -60 to -30 and tested negative to an agent identification test carried out not earlier than 7 days before the movement (Scenario B2). Alternatives involving movements during vector free periods or vaccination were not considered.

A spreadsheet model was constructed that calculates the likelihood that BTV is introduced by the movement, despite the precautionary measures taken. The likelihood that BTV is introduced by infective vectors contained in the vehicle is also assessed. A quantitative approach was used (@ RISK, Palisade Corp., Ithaca, USA, Latin hypercube sampling, 5,000 iterations) to take into account inherent uncertainty and variability of input parameters. Inputs on incidence and prevalence in sheep were obtained from Dutch reports on the current outbreak, whereas information pertaining to the vector was gathered from the literature, from Swedish trapping data and also based on expert opinion. Estimates on test sensitivity and specificity were obtained from the literature.

Alternatives focusing on seropositive animals will be attractive in areas where the individual animal prevalence is high. However, under the current outbreak of BTV

serotype 8, within-herd prevalence of seropositive sheep has been fairly low. Thus, it is perhaps more likely that vector protection (with or without additional testing) will be used. In the legislation, the meaning of “protection against vectors” is not specifically defined, but may be interpreted as application of insecticides with or without additional housing measures. There is a substantial gap in knowledge about the effectiveness of such measures aimed at protecting livestock from the vector, in particular as the current outbreak involves several new species of Culicoides. For this reason, the effect of varying effectiveness of insecticides on the risk of introducing BTV was explored further. Results from the analysis will be presented.

Emerging diseases in the last decade; short review

By Jørgen M. Westergaard – ADC-Consult, Denmark

Emerging diseases may be defined in different ways. This paper will adhere to the definition adopted by the World Organisation for Animal health, OIE, where emerging disease means: a new infection resulting from the evolution or change of an existing pathogenic agent, a known infection spreading to a new geographic area or population, or a previously unrecognized pathogenic agent or disease diagnosed for the first time and which has a significant impact on animal or public health. Some of the emerging diseases recorded within the last decade in Europe have had a devastating impact on animal production and in some situations on national and international trade in livestock and their products. The diseases have in common that the timing and nature of their occurrence has been unpredictable and likewise their consequences.

The factors which have had an influence on the occurrence of emerging diseases include increased contact between human and wild animals, movement of people and animals and products of animal origin, changes in animal husbandry and production technologies, new environmental situations and resistance to anti-microbial agents. Furthermore, some pathogenic agents have a potential for causing emerging diseases through bioterrorism. The presentation will review some of the emerging diseases which have created animal health and public health problems since the early 1990s including Bovine Spongiform Encephalopathy (BSE), Porcine Reproductive and Respiratory Syndrome (PRRS), Post-weaning Multisystemic Wasting Syndrome, (PMWS), Bluetongue (BT), African Horse Sickness (AHS), Avian influenza (AI), West Nile Fever (WNF), Rabies, Tuberculosis and Q-fever.

The presentation will in addition briefly deal with experiences gained from previous risk analysis work carried out in the veterinary sector including the work relating to the policy adopted in Europe for the control of foot and mouth disease.

List of participants including the speakers

Table 2: List of participants

Name	Institution/organisation	Country
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Ann Lindberg	National Veterinary Institute, Swedish Zoonosis Centre	Sweden
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Anne-Grete Hassing-Hvolgaard	Danish Veterinary and Food Administration	Denmark
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Arve Lund	National Veterinary Institute	Norway
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Bára Heimisdottir	Icelandic Food and Veterinary Authority	Iceland
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Bjørn Lium	National Veterinary Institute	Norway
Bjørn Næss	Norwegian Scientific Committee of Food Safety	Norway
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Fredrik Andersen	Norwegian School of Veterinary Science	Norway
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Joakim Holmdahl	Swedish Board of Agriculture	Sweden
Jonas Mulius	National Veterinary Laboratory	Lithuania
Jorunn Jarp	National Veterinary Institute	Norway
Jørgen Westergaard	ADC-Consult	Denmark
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Marianne Elvander	National Veterinary Institute	Sweden
Marion Wooldridge	Veterinary Laboratories Agency	UK
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Michael S. Grunér	Aland Government	Aland
Mindaugas Kasinskas	State Food and Veterinary Service	Lithuania
Mona Torp	Norwegian Food Safety Organisation	Norway
Niina Tammiranta	Finnish Food Safety Authority Evira	Finland
Oddrun Espelund	Norwegian Food Safety Organisation	Norway
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Solveig Sundsbø	Norwegian Food Safety Organisation	Norway
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Tore Tøllersrud	National Veterinary Institute	Norway
Tore Håstein	National Veterinary Institute	Norway

The organising committee

The organising committee of the seminar was the veterinary contingency planning group, established within the responsibility of the Nordic Council of Ministers, with the duty to coordinated contingency planning and preparedness work related to infectious animal diseases in the region.

The members of the organising committee were

- Audur Arnthorsdottir, Iceland; Food and Veterinary Authority
- Camilla Brasch Andersen, Denmark; Veterinary and Food Administration
- Jessica Løfgren-Eriksson, Finland; Food Safety Authority, Evira
- Joakim Holmdahl, Sweden; Board of Agriculture
- Mindaugas Kasinskas, Lithuania; State Food and Veterinary Service
- Kristine Lamberg, Latvia; Food and Veterinary Service
- Eivind Liven, Norway, Food Safety Authority
- Ardo Pakkonen, Estonia; Veterinary and Food Board
- Jørgen M. Westergaard, ADC-Consult, Denmark (Employed by the organising committee as private consultant)

Nordic-Baltic Bluetongue Simulation Exercise "HOT-AIR"

Report from The Nordic-Baltic Bluetongue Simulation Exercise "HOT-AIR". 14–16 May 2008, Oslo, June 2009, Nordic-Baltic Veterinary Contingency Group, Eivind Liven, chairman

Abstract: Simulation exercises are very valuable tools for testing national contingency plan. The report addresses "lessons learned" during an exercise covering a rapid spreading vector borne disease.

<i>Nordic-Baltic Bluetongue Simulation Exercise "HOT-AIR"</i>	33
Executive Summary	34
Introduction.....	35
Aim	35
Objectives	36
Bluetongue – an emerging disease.....	37
The scope of the Nordic-Baltic Bluetongue simulation exercise	41
Inter-Nordic-Baltic scenario for simulation exercise	42
Scenarios for individual countries for simulation exercise	42
Implementation.....	43
Evaluation	43
Acknowledgements.....	47
References	47

Executive Summary

Simulation exercises are considered as a very valuable tool for testing contingency plans established for the control and eradication of rapid spreading animal diseases. The Nordic Council provided in 2005 financial support for a successful foot and mouth disease simulation exercise (1). Since 2005 Bluetongue (BT), a vector-borne viral disease, has emerged in northern Europe as a devastating livestock disease and more than 2000 outbreaks were registered in 2006 in Belgium, France, Germany, Luxembourg and the Netherlands. Before 2007 the disease had not been recorded in any of the Nordic-Baltic countries.

With the objective to increase BT preparedness the central veterinary administrations of the Nordic and Baltic countries prepared in the autumn of 2006 and early spring of 2007 jointly a comprehensive BT simulation exercise. The preparatory work was by and large carried out by the Nordic-Baltic Veterinary Contingency Group. During the preparatory work the Group:

- made use of the experiences gained from the Nordic foot and mouth disease simulation exercise conducted in 2005;
- took into account the special epidemiological features of BT and the legislation; recently adopted by the European Union;
- introduced the application of a new IT support tool "Exonaut".

This document provides information on the planning, implementation and evaluation of the Bluetongue simulation exercises held in Denmark, Estonia, Finland, Latvia, Lithuania, Norway and Sweden from 14 to 16 May 2008. The simulation exercises carried out by the different countries included:

- a number of tasks with focus on Inter-Baltic-Nordic activities important for controlling Bluetongue outbreaks;
- a large number of tasks which were of particular interest to individual countries with focus on local conditions and demands.

The establishment of movement restrictions of animals susceptible to Bluetongue is important for avoiding the spread of Bluetongue. The establishment of the restrictions take into accounts the measures for protection zones (each with a radius of 100 km) and surveillance zones (each with a radius of 150 km). The veterinary administrations in the Nordic-Baltic countries established, during the Bluetongue simulation exercise, a total of 20 protection and surveillance zones and the movement restricts covered about 77,500 km². About 400 veterinarians were heavily engaged in the exercise and obtained special training. Veterinarians from Iceland participated during the exercise as observers in other countries. The different scenarios used for the national simulation exercise have been annexed to the report.

Based on the evaluation carried out it was concluded that the simulation exercise could be considered to be a success. For all countries, except Denmark, the timing of the simulation exercise in the spring of 2008 was perfect. Denmark had experienced outbreaks in 2007. The confirmation of Bluetongue in Sweden took place shortly after the conduct of the exercise. In Norway the disease was diagnosed early 2009. The disease was an actual threat to Finland and the Baltic countries. The exercise helped the participants from all the Baltic and Nordic countries to get a better understanding of what Bluetongue is and which problems to be faced in the event the disease is introduced into the national population of ruminants.

One of the recommendations from the evaluation relates to the need for a better communication between the veterinary authorities of the Nordic and Baltic countries. A simulation exercise with focus on Inter-Baltic-Nordic communication could remedy this situation and the Nordic-Baltic Veterinary Contingency Group has taken the initiative to conduct an exercise in 2009 which will test communication and communication procedures at the level of Chief Veterinary Officers (CVO) and on the sub-CVO operational and management level.

Introduction

Bluetongue (BT) is listed by the World Organisation for Animal Health (OIE) as a notifiable disease. It is an infectious, non-contagious insect-borne viral disease of a broad spectrum of domestic and wild ruminants. Sheep are still for the livestock producer the main host of the virus, but the infection occurs, although usually sub-clinically, in cattle. The virus is transmitted by midges of the genus *Culicoides*.

The disease had until 2007 never been recorded in any of the Nordic-Baltic countries. The rapid spread in 2006 in northern Europe encouraged the veterinary services in the Nordic-Baltic countries to carry out a simulation exercise with the aim of testing BT contingency plans established by the individual countries. The decision to conduct such an exercise was furthermore stimulated by EU legislation covering rapid spreading emerging diseases like BT.

Aim

The main aim of the Nordic-Baltic simulation exercise was to test the contingency plans established by the Baltic and Nordic countries for the control of Bluetongue.

Objectives

Within the aim of testing contingency plans the exercise included (a) inter-Baltic-Nordic activities and (b) activities in individual countries with focus on national conditions and demands.

a. Inter-Baltic-Nordic activities

The tasks performed included:

- Communications between the Baltic and Nordic countries at senior management level as well as communication between officers in charge of issues related to BT control.
- The administration of cross-border protection zones/surveillance zones.
- Review of conditions for trade between the countries affected by BT with regard to animals kept at farms situated in protection and surveillance zones.
- The use of a jointly agreed evaluation system.

b. Activities in individual countries

The tasks to be performed included:

- Operation of a surveillance programme.
- Visit to sheep and goat flocks and cattle herds where BT is suspected.
- Visit to sheep and goat flocks and cattle herds where BT is confirmed.
- Establishment of protection zone and surveillance zones in relation to BT outbreaks.
- Visit to a slaughterhouse where BT is suspected in sheep.
- Visit to a livestock market where BT is suspected.
- Prepare and implement a vaccination plan against BT.
- Establishment and testing of local disease control centers.
- Test of IT facilities.
- Tracing of unregistered herds of sheep and goats in protection/surveillance zones.
- Recruiting of personnel and prioritization of tasks during long term crisis.

Bluetongue – an emerging disease

BT is a non-contagious, insect transmitted, viral disease of sheep. The infection does also occur in cattle, goats and wild ruminants, but in these species the infection may be inapparent. The OIE reports that the virus is present in a broad band of countries extending between latitudes of approximately 50° N and 35° S, but it is known to be expanding in the northern hemisphere. In this context it must be emphasized that 12 EU member states, Austria, Bulgaria, Cyprus, Greece, Hungary, Italy, Malta, Romania, Portugal, Slovakia, Slovenia and Spain, are situated within this band. South of the 50° N are also major geographical parts of France and Luxembourg and certain southern areas of Germany, the Czech Republic and Poland.

The biological vector for BT is insects of the Genus *Culicoides*, commonly known as midges. There are over 800 species of *Culicoides*. The species of *Culicoides* known to be of importance for the transmission of BT are *C. variipennis* and *C. imicola*. A climate with a hot summer and a mild winter with cool spells, similar to those found in a number of areas in the Mediterranean, have for years been known to favour the presence of *Culicoides* capable of transmitting the virus. BT has probably been in Cyprus since 1924, although the virus was first isolated in 1943. Records of the veterinary administration of Cyprus show that in some years no outbreaks were recorded while in others outbreaks of exceptional virulence were observed.

In sheep BT is characterized by inflammation, ulceration and erosion of the mucosae of the mouth, swollen and sometimes cyanotic tongue, high temperature, depression and lameness due to coronitis and myositis. The BT-virus contains 24 serotypes.

The occurrence of Bluetongue in the EU member states

Disease outbreaks of Bluetongue (BT) in Europe are with regard to the geographical distribution and timing basically related to 3 different epidemiological situations during the period 1998–2008.

BT introduced in 1998 into Greece

In November 1998 BT was recorded on the islands of Kos and Rhodos in Greece. Epidemiological data suggested that the infection was introduced by wind-borne incursion. During 1999 the disease reappeared and was confirmed in several parts of Greece. A total of 1,254 outbreaks were reported during that year and laboratory examinations revealed that the 3 different serotypes 4, 9 and 16 were present. No outbreaks were recorded in 2000, but in 2001 a number of scattered outbreaks were registered, most of them on the Lesbos island and along the Albanian border.

BT introduced in 2000 into France, Italy and Spain

The disease appeared during the second part of 2000 in Corsica, France, Sardinia, Sicily and Calabria in Italy and in the Balearic islands of Spain. The BT virus isolated in Corsica and Sardinia belonged to serotype 2, while in the south of Italy two serotypes, 2 and 9, were recognized. Since 2000 the disease has been present in different parts of France, Italy and Spain and the number of outbreaks during the period 2000–2007 is recorded in table 1.

Table 1: Outbreaks of Bluetongue reported by EU Member States during the period 1998–2007

Member State	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Belgium									695	6,870
Czech Republic										1
Denmark										1
France			49	323		17	34	6	6	15,298
Germany									869	20,476
Greece	84	1,254		172						
Italy			6,744	6,221	11	2	136		226	2
Luxembourg									5	1,315
Netherlands									450	5,798
Portugal									1	158
Spain			505			14	317	87		7,835
UK										65
Total	84	1,254	7,298	6,716	11	33	499	93	2,265	57,819

BT introductions into Belgium, Germany, the Netherlands and Luxembourg, Denmark and the UK

During August 2006 BT was reported in sheep and cattle in the Netherlands, Belgium, Germany and the northern part of France, the French Ardennes. The first suspected cases of BT were observed in a flock of sheep in the Netherlands and samples obtained from the flock revealed the presence of BT virus serotype 8. This strain of virus has never been recorded in Europe before and the precise origin of the virus remains unknown. The virus circulated in the autumn with a peak of outbreaks in October and confirmation of the presence of BT in Luxembourg in early December. The confirmation of BT in sheep and cattle north of the 50 N was the first time in Europe. The geographical, climatic and husbandry factors influencing the epidemic are unclear, but the year 2006 was by a number of EU-member states reported as a “record warm year”. The spread of BT may perhaps therefore primarily be attributed to the warm summer.

During 2007 BT reappeared in Belgium, France, Germany, Luxembourg and the Netherlands. Furthermore it appeared also in the autumn of 2007 in Denmark, the Czech Republic and the UK.

In 2008 BT spread into Sweden, see figure 1, and the disease was in 2008 recorded in a large number of European countries and more than 8,000 outbreaks were reported.

Figure 1: The spread of Bluetongue in 2008 in the EU

Legislation and disease control measures

The measures to combat and eradicate BT in the Member States of the EU and in Norway are laid down in Council Directive 2000/75/EC (2). On suspicion of disease the basic measures include:

- placing the suspect holding under official supervision;
- a ban on movement of animals from the holding;
- confinement of animals of the susceptible species to prevent contact with the vectors;
- insecticides treatment.

On confirmation of disease the measures include:

- the application of the measures outlined for a suspect holding at all holdings located within a radius of 20 kilometers of the infected holding;
- disposal of infected carcasses;
- a protection zone with a radius of at least 100 kilometers;
- a surveillance zone with a depth of at least 50 kilometers extending beyond the limits of the protection zone.

The demarcation of the zones must take account of geographical, administrative, ecological and epizootological factors connected with BT and the control arrangements.

With the objective to clarify the demarcation of zones and the conditions for exempting from certain movements bans the Commission adopted in 2005 Decision 2005/393/EC. The Decision outlined how animals could be moved out of restricted zones in a case-by-case risk assessment scenario and under such conditions as vaccination, pre-movement isolation, protection from attack from *Culicoides* and laboratory testing. The Decision was repealed on 26 October 2007 and replaced by Commission Regulation (EC) NO. 1266/2007(3). The Regulation lays down rules for the control, monitoring, surveillance and restrictions on movements of animals. In this context it may be emphasized that a Regulation is binding and directly applicable by law in all Member States.

Vaccination

Based on the BT situation in Greece and certain third countries in the Mediterranean area, the Commission arranged in 2000 for the purchase of BT vaccines for a Community emergency stock. The only commercial vaccines available were live attenuated virus vaccines. No vaccines were produced within the EU and vaccines for the emergency stock were purchased at the Onderstepoort laboratory in South Africa. The vaccines selected for the Community reserve were a trivalent vaccine (serotypes 4, 9 and 16) and a monovalent vaccine (serotype 2); the strains already present or directly threatening the EU member states situated in the Mediterranean region.

From 2000 and the following years targeted vaccination programmes were carried out in Spain, France and Italy to raise immunity against BT serotypes that were circulating in each area. No vaccination was carried out in Greece. Statistical serological testing of vaccinated animals and serological surveillance of sentinel animals in the “at risk” areas supplemented the vaccination programme.

The potential drawbacks by using live attenuated vaccines were frequently discussed by scientists and the veterinary administrations of the member states and the Commission. With the aim to solve the problems caused by using the prevailing vaccines, funds were made available for research which should lead to the development of safe, efficacious inactivated whole virus vaccines or sub-unit vaccines or recombinant baculovirus expressed vaccines.

Following the occurrence of BT in Denmark and Sweden, both countries have made use of vaccination like most other countries affected by BT.

Surveillance

The relatively rapid spread of BT to new geographical areas after 1998 highlighted the need for an active surveillance in order to better understand the epidemiological situation and the risk the disease posed to the susceptible EU livestock population. The initial step included the establishment of surveillance programmes in Greece, France, Italy and Spain, which were financially supported by the Community. The outbreaks of BT north

of the 50 N in the autumn of 2006, throw the attention to the fact that in the coming years livestock in a large number of countries in Europe, not only the Mediterranean area, might be exposed to the virus.

With the desire to develop a harmonized approach to BT surveillance, the Commission developed a working document concerning the matter:

- It is emphasized that the surveillance shall focus on measures to be applied in (a) restricted (non-free) zones and (b) non-circulation in the restricted zone in order to better define the appropriate extent of the zone.
- To gather information on (a) the presence of vector species involved in disease transmission, their competence, numbers and distribution (b) identification of the vector-free season or periods with the lowest risk of viral transmission.

In the non-restricted zone the objectives will be to detect as early as possible virus circulation and to confirm the absence of BT. The measures proposed to be applied by the EU member states cover:

- entomological monitoring; placing of traps
- serological monitoring using sentinel animals
- virological monitoring
- enhanced passive clinical surveillance
- wildlife monitoring.

The scope of the Nordic-Baltic Bluetongue simulation exercise

The simulation exercise encompassed integration across state borders and at national level involved central veterinary administrations, local veterinary administrations and relevant stakeholders such as livestock owners, livestock markets, haulers and dealers, veterinarians in private practice, consumer organizations and the media.

The principle plan for the national part of the exercise differed from one country to another. Basically 3 categories of simulation exercises were carried out:

- a central table top exercise;
- a table top exercise involving different levels of the competent authority;
- an exercise including practical field work, sampling and laboratory testing both in official and private sector.

The 1st category of exercise was characteristic for Estonia and Latvia, the 2nd category for Finland and the 3rd category for Sweden and Norway. Denmark had a special focus on training of their local crises centers. They also involved an element of classical swine fever in the exercise.

Information on the number of BT suspicions and confirmation of BT infections and persons scheduled to be trained is given in table 2 as well as information on the budget allocated for the exercise.

Table 2: Field and training activities foreseen during simulation exercise and estimated budget for the simulation exercise

Field activities	DK	EST	FIN	LAT	LIT	NO	SW
BT suspicions and number of suspicions	0	1	16	4	1	3	2
Tracing of herds	10	-	-	X	-	-	-
Collection of samples for laboratory examination and number of samples	No	X	X	X	X	Yes	No
Transport of samples to laboratory	No	X	X	X	X	Yes	No
Number of BT confirmed Outbreaks	10	1	16	2	1	3	2
Establishment of protection/surveillance zones	10	1	2	1	1	3	2
Preparation and implementation of vaccination plan	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Training of personnel during exercise	80	25	30	20	78	105	45
Estimated total budget, EURO							28,000

Note: X: Simulated activity.

Inter-Nordic-Baltic scenario for simulation exercise

In the past 100 years the number of cold and frost days has decreased in most parts of Europe, whereas the number of days with temperatures above 25 °C (summer days) and heat waves has increased. The frequency of very wet days has increased in mid and northern Europe. The optimal temperature for BT-virus transmission has been identified as 27–30 °C and within this temperature range:

- maximum numbers of *Culicoides* survived long enough to transmit at least once;
- viral polymerase activity (i.e. viral replication rate) was found to be maximum.

The Baltic and Nordic countries have during the period 24 April to 10 May 2008 experienced exceptional warm weather conditions with temperatures reaching 32 °C in Helsinki, Stockholm and Tallinn. During the days with very warm weather the rain has been plentiful with a significant impact upon the biting midge populations.

On 14 May symptoms of BT were observed in sheep in Estonia, Finland, Latvia, Lithuania, Norway and Sweden. Denmark confirmed the presence of BT in 10 different herds including both sheep and cattle.

Scenarios for individual countries for simulation exercise

Scenarios were prepared by individual countries in the Nordic-Baltic Region with the exception of Iceland. A template was distributed to all countries concerning the matter. The scenarios are available for further studies in the Central Veterinary Administrations of all Baltic and Nordic countries. Certain information related to field and training activities is given in table 2.

Implementation

The simulation exercises did, with reference to the objectives, include inter-Baltic-Nordic activities. The names of the coordinators and their coordinates during the implementation of the simulation exercises are listed in table 3.

Table 3: Name, email addresses and phone numbers of coordinators during the implementation of BT-simulation exercise

Country	Name of coordinator	Email of coordinator	Phone number(s) of coordinator
Denmark	Hanne M. Hansen	HMH@fvst.dk	+45 33 95 63 67
Estonia	Ago Partel	Ago.partel@vet.agri.ee	+372 605 1710
Finland	Jessica Lofgren-Erikson	Jessica.lofgren-erikson@evira.fi	+358 40 572 2897
Latvia	Edvins Olsevskis	edvins.olsevskis@pvd.gov.lv	+371 67027581
Lithuania	Mindaugas Kasinskas	mkasinskas@et.lt	+370 52 40 43 40
Norway	Eivind Liven	Eivind.Liven@mattilsynet.no	+47 23 21 67 12
Sweden	Joakim Holmdahl	Joakim.holmdahl@siv.se	+46 036 15 62 83

Note: Veterinarians from Iceland participated in the simulation exercises conducted by some of the other countries.

Evaluation

The observations made and results obtained from the simulation exercises were discussed at a meeting held 16 and 17 September 2008 at the archipelago of Åland, Finland. This meeting was attended by Dr. Philippe Houdart, Belgium who was invited to act as an external evaluator of the simulation exercise. The observation and conclusions made by Dr. Philippe Houdart are given below.

Introductory remarks

Between 14 and 16 May 2008, seven Nordic and Baltic countries organised the joint simulation exercise "HOT AIR". This exercise was set up by the Nordic- Baltic Veterinary Contingency Group, reporting to the Nordic Council of Ministers. At the time of the exercise, only Denmark had been directly confronted with the disease. The 6 other countries, Norway, Sweden, Finland, Estonia, Latvia and Lithuania, were not among the 15 European countries already implicated by BTV8 or another BT serotype. Iceland participated in the exercise by sending observers to some of the other countries.

The exercise was a real-time exercise using fictitious suspicions and outbreaks in existing farms and facilities. Each country involved was responsible for the development of its own scenario, thus permitting it to focus on local conditions and demands. Likewise, each country conducted and managed its own exercise, independently from the 6 other countries.

However, the main objectives of “HOT AIR” were common for all seven countries involved:

- the prime objective was to test the individual national contingency plans to control suspicions and outbreaks of BT;
- the second objective was to test the communication and the exchange of information between the different countries.

The Nordic-Baltic Veterinary Contingency Group was responsible for initiating the idea of the exercise and supporting the individual countries by supplying formats for the preparation of the exercise. The countries were given the opportunity to use the software package Exonaut as much as possible in supporting the exercise and reporting on the evaluation.

This report summarizes an assessment of the exercise as perceived by an external expert. It is based on the scenarios, the evaluation forms and other documentation made available by the individual participating countries through the Nordic-Baltic Veterinary Contingency Group and on the discussions and reflections held during the autumn meeting of this group in Åland on 16 and 17 September 2008. The assessment is limited in its scope in a sense that the expert was not involved in the preparation of the exercise, nor present during the actual execution of the exercise in May 2008. It is therefore not an assessment of the way in which the individual countries of the Nordic-Baltic region have conducted the exercise.

Strong points and achievements of the exercise

On the whole, the exercise can be considered to be a success. It has helped the participants to get a better understanding of what BT is and what problems are to be expected or will have to be faced in the case of an introduction of this vector related disease in the ruminant population of their country. Where perhaps prior to the exercise the majority of the participants were prepared to address BT in the “traditional” way other major animal epizootics as classical swine fever and foot and mouth disease are controlled, this view has certainly shifted during the exercise.

The following observations underline the success of the exercise or can be considered as its major achievements:

- the preparation and the organization of a large-scale, multilateral, three-day exercise between 7 countries, aiming for the same objectives and involving both authorities and stakeholders and, in most of the countries, as well fieldwork, is a rare achievement, that in itself amply justifies the efforts put into the preparation and the execution of the exercise;
- as stated above, the exercise was developed around two clear objectives that were common for each of the countries involved. On the one hand, this approach allowed focusing on the essentials of disease control that is tackling the disease and

communication. On the other hand, since each country had to develop its own scenario within the common framework, there was still enough room for emphasizing the local needs and for focussing on more specific aspects of the control of the disease and the national crisis management plan;

- the exercise was organised at the opportune moment. Although presently the majority of the countries involved still have not been confronted directly with the disease, the developments in recent months have proven that BTV1 and BTV8 in particular still have not reached the limits of their spread. The exercise has certainly allowed Sweden, Denmark and Norway to prepare better for the outbreaks that occurred later in 2008 and early 2009;
- the involvement in each country of a wide range of participants from local and national authorities, laboratories and stakeholders is much appreciated. Specifically the involvement of the stakeholders is important, since the simulation exercise will certainly have allowed them to get familiar with the particularities of BT. This is the more significant since a “regular” BT season spans April to December and the control and eradication of a BT epizootic requires a long-term effort of several years, thus presenting the stakeholders with an exceptional challenge;
- the standardised guideline document to help prepare the exercise and the questionnaire for evaluating the exercise and, where used, the Exonaut software were appreciated;
- all experts of the Nordic-Baltic Veterinary Contingency Group confirmed that the major objective with regard to the testing of the contingency plan was largely met, since the exercise allowed to improve the individual contingency plans.

Points open for improvement

The following points are open for improvement and may be the focus of future exercises. “Open for improvement” means that their execution was missing or not optimal during the exercise. This in itself must not be considered to be a setback or a shortcoming of the exercise, but rather as a positive outcome. The trans-border communication, one of the two major objectives of the exercise, failed. Messages intended for the neighbouring countries were not sent or did not reach the appropriate or relevant contact point on the other side. This failure was the result of a combination of several factors. The most important to mention are:

- the absence of the CVOs, who are normally seen as the major contact point in each country but were now present at a CVO meeting abroad and de facto did not participate in the exercise, thus in practice blocking the main route of communication;
- failure or absence of a backup for the CVO and, more in general, of dedicated contact points between the different authorities across the borders;
- lack of clear procedures with regard to the inter-Nordic-Baltic communication;
- problems with the sending, receipt and exchange of electronic messages;

- the IT support tool Exonaut was not used by all participating countries. Where used, the tool was not entirely a success. This is most likely due to the lack of sufficient time or willingness to include the tool properly in the exercise and the absence of enough skilled operators that are sufficiently familiar with the tool;
- although all participating countries did a proper internal evaluation of the exercise using Exonaut or the standardised form extracted from Exonaut, still more could have been gained and learned by a joint evaluation meeting on Nordic-Baltic level on the problems encountered or questions still open after the exercise. This is a missed opportunity;
- the scenarios, although of good quality, can still be ameliorated by inserting more options into the storyboard (for instance having suspicions/outbreaks in imported animals, forcing the players to assess at the same time the situation for both imported and indigenous infections);
- where cross-border zones were needed because of outbreaks near the borders and, in spite of the communication problems, the neighbouring country received the communication about the zones. In most cases this information was not included in the exercise of the receiving country. The exercise would have profited from this element of surprise as an additional challenge for the players.

Recommendations

It is recommended to review the procedures, the players and each player's role with regard to international communication. The veterinary authorities from the Nordic and Baltic countries would profit from a short and simple simulation exercise focussing only on the inter-Baltic-Nordic communication. The preparation and execution of this exercise would permit to define and test the contact points and their alternates, both on the level of the CVO and on the executional level, their role in the communication and the communication procedures.

- this first trial of Exonaut is not enough to allow a proper evaluation of its use as an IT tool in veterinary simulation exercises. It is therefore recommended not only to test it at least once more in the next exercise, but also to make sure that a sufficient number of people are trained in its use;
- it is recommended to conclude all inter-Nordic-Baltic simulation exercises with a formal evaluation meeting in which all countries give an account of their own evaluation, allowing a common reflection and discussion on the exercise and the problems encountered.

Acknowledgements

The organizers of the Simulation Exercise "HOT-AIR" would like to convey their thanks to the Nordic Council of Ministers for the financial support made available for the preparation, implementation and evaluation of the BT simulation exercise.

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Seminar on the Importance of Vectors in the Spread of Animal Disease Today and in the Future

Riga, 13–14 October 2009

Abstract: Global climate changes predictions suggest that far-ranging effects may occur in the population dynamics of arthropod vectors. The report highlights the presence of vectors in the Nordic-Baltic countries, surveillance requirements and development of models.

Seminar on the Importance of Vectors in the Spread of Animal Disease Today and in the Future	49
Editorial preface	50
Acknowledgement	51
Conclusions and recommendations.....	51
Programme for the vector seminar	54
Abstracts from invited speakers	56
Evaluation	72
List of participating experts	74
The organizing Committee	75

Editorial preface

The Nordic Council of Ministers adopted in 2006 a strategy plan which included cooperation within Nordic-Baltic veterinary contingency planning. The strategy plan emphasized that exotic animal infectious disease, with zoonotic potential as well as emerging diseases, should be prioritized. A Nordic-Baltic Veterinary Contingency Group (N-B VCG) was established. The N-B VCG, as part of the Working Group responsible for Microbiology, Animal Diseases and Animal Welfare, has been working continuously with subjects that serve the objectives outlined in the strategy plan.

To achieve a common understanding of the risks related to the appearance of exotic infectious animal disease including zoonosis and emerging diseases among key personnel in the respective veterinary administrations and scientific institutions in the Nordic-Baltic countries the N-B VCG has prioritized:

- workshops and seminars
- simulation exercises
- training programmes.

It has been a primary goal not only to achieve updated knowledge on specific diseases and disease control issues, but also to establish a Nordic-Baltic network among professionals working within the veterinary services, relevant scientific institution and the private sector.

The vector seminar in Rigs was a consequence of the spread of Bluetongue from the Southern part of Europe to the more Nordic regions of the continent. Bluetongue was already diagnosed in the regions (Denmark, Sweden and Norway) and it was felt to be of great importance to pay more attention to vector borne diseases in general. The quick spread of the Bluetongue virus was unexpected and should be taken as a warning for future challenges.

The overall objective of the seminar was to extend the knowledge of vector borne disease and thereby increase the possibility of an early detection as result of a reviewed and updated contingency planning process.

Close to 100 experts, including professionals from official authorities, laboratory and university bodies as well as private sector attended the seminar. The speakers came mainly from Nordic-Baltic countries. Professionals from UK were also engaged to give actual presentations at the seminar.

Through the excellent presentation given and the following exchange of views and experiences between the participants the N-B VCG is confident to have contributed to an increase attention and understanding of this category of infectious disease and thereby a good and knowledge based platform for amending the contingency plans in the respective countries. We also have the opinion that personal relations and previous established networks have been strengthened.

Jønkøping, March 2010, Nordic-Baltic Veterinary Contingency Group
Joakim Holmdahl, Chair

Acknowledgement

The Nordic-Baltic Veterinary Contingency group wishes to thank the Nordic Council of Ministers for their financial support made available for the preparation and implementation of the vector seminar. The support has made it possible for national experts to meet in Riga to discuss the many subjects that arises in connection with the climate associated spread of vector borne animal diseases which has obtained increased interest also in the Nordic region of Europe.

A special thank shall be addressed to the speakers and their well-prepared presentation, the chairmen managing the different sessions in a competent way and all the experts for their active participation during the seminar. We are confident that these discussions and exchange of views will be beneficial to future contingency planning in the veterinary services in the Nordic-Baltic region.

The seminar would not have been a success without the valuable support given by the Chief Veterinary Officer of Latvia, Dr. Mareks Samohvalovs, and the staff of the Food and Veterinary Services, Riga, Latvia.

Conclusions and recommendations

Conclusions

Climatic changes and globalisation are phenomena which in recent years have been affecting the introduction and spread of vector borne disease of importance for human and animal health. The predicted global warming with increase in mean temperature will most likely in the Nordic and Baltic countries create more favourable conditions for the transmission and distribution of vector borne infectious diseases and the veterinary and medical professions will be exposed to new challenges with regard to arthropod borne diseases.

This Nordic-Baltic seminar was conducted with the objectives:

- to highlight the importance of *Culicoides* spp. In particular with reference to Bluetongue;
- to elucidate the importance of climatological changes on the habitat and population size of vectors;
- to focus on vectors of importance for animal diseases in the Nordic and Baltic countries;
- to identify needs and gaps in vector borne disease research areas and disease control measures.

Approximately 90 persons, coming from national animal health and food safety authorities, relevant scientific institutions and the private sector, attended the seminar. All Nordic and Baltic countries, except Iceland, were represented.

The first day of the seminar was primarily allocated to a thorough review of Bluetongue virus and vectors (Insects and ticks) of importance to animal health in the Nordic and Baltic countries. The second day dealt in particular with the vector borne disease situation in the individual countries, ongoing research and the epidemiological and zoonotic aspects of arthropod borne virus diseases in Northern Europe.

The presentations made during the seminar formed an excellent basis for exchange of views between the experts from the participating countries. It is evident that the climate will continue to change over the coming decades regardless of mitigation measures. Thus, society and the animal and health sectors will have to adapt to the consequences of the climate change. National vulnerability, risk and adaptation assessment are essential for the understanding of potential health impacts and adaptation needs at the local level. Cross-sectoral collaboration is important, in particular between the veterinary and human health sectors.

The Nordic and Baltic countries share many biogeographical, climatic and epidemiological conditions. The desire and need for collaboration between countries in the Nordic-Baltic region will be increasingly important for early detection of new threats to the region, such as the introduction and establishment of new vectors, reservoir species and pathogens.

Based on information presented during presentations, valuable discussions and reflections the following recommendations were drafted.

Recommendations

Surveillance

Climate change will at our higher northern latitudes contribute to substantial changes in local ecological conditions, which in turn may facilitate the introduction of pathogens and allow vector and reservoir species to become established, and for new human and animal diseases to emerge. Furthermore, the increasing travel of humans, trade in and movements of animals and animal products around the globe will without doubt increase the risk of introduction of new pathogens as well as new vectors (by mistake) into the Nordic and Baltic countries.

It is recommended to establish effective targeted surveillance systems for selected arthropod borne diseases across the different countries to allow a detailed risk analysis, including evaluation of the potential spread to new areas or the new introduction of exotic species or disease agents:

1. the data gathered should be freely shared between the different countries of the Nordic-Baltic region;
2. if possible a common approach to surveillance should be adopted so that the results are comparable across the region;
3. effective diagnostics should be available for all the selected diseases;
4. if possible countries neighbouring the Nordic-Baltic region should be invited to participate in the activities listed under (1) and (2).

Disease control

The seminar recognized the complexity and large number of factors associated with the occurrence of vector borne diseases.

It is recommended that optimum strategies for disease management shall be very system-specific and depend on detailed understanding of interactions between climate, parasite abundance, host availability and the cues for, and economics of, intervention.

Cost-benefit analysis

Since 1998 a number of countries in Europe have experienced outbreaks of Bluetongue and a number BT virus strains have been identified (BTV-1, BTV-2, BTV-4, BTV-6, BTV-8, BTV-9 and BTV -16). The measures applied to control and eradicate Bluetongue virus infections have included surveillance, exchange of epidemiological information, movement restrictions, vector control and vaccination. In spite of great efforts made the disease continues to create problems for livestock production. A large number of data related to the spread and occurrence of disease and application of control measures are available.

It is recommended that a comprehensive cost-benefit analysis is carried out to supply relevant data the continuous fight against different strains of blue tongue virus.

Modelling transmission intensity and dispersal of vector borne diseases

Wind spread models have been able to explain introduction of bluetongue from Africa to Europe and in some cases between European countries. Quantitative spatial models for predicting vector densities as well as transmission intensities of vector borne diseases may be developed into an effective management tool. Reliable models allow development and fine tuning of preventive and control strategies, and may be used to develop cost efficient targeted surveillance. Models may also be able to predict the impact of climate change and local changes in the environment. However, the models rely on complex biological parameters which are difficult to quantify. It appears especially difficult to model density of vectors and the impact of temperature on some specific biological parameters. Statistical models contrary to mathematical process models do not rely on detailed biological understanding. Statistical models may predict impact of climate change. However, they are less suited to predict effect of e.g. various levels of vaccination cover.

It is recommended that the development of models of transmission intensity and dispersal is assessed as tools for the development of cost efficient preventive strategies and control strategies, and for estimating the future impact of climate change, trade in and movements of animals.

Contingency planning

Most European countries have established contingency plans for rapid spreading viral diseases covered by EU legislation such as avian influenza, bluetongue, classical swine fever, foot and mouth disease, Newcastle disease and viral haemorrhagic septicaemia. The main elements of the plans relate to disease suspicion, application of control and eradication methods and the cooperation between the competent authorities and other stakeholders. An important aspect is the availability of information on disease awareness.

It is recommended that the Nordic-Baltic Veterinary Contingency Group in future becomes more engaged in enhancing disease awareness and promoting training programmes relevant for the recognition and control of vector borne animal diseases.

Programme for the vector seminar

- Time: 13 and 14 October, 2009
- Place: Reval Hotel Latvija, Elizabetes Str. 55, Riga, Latvia
- Secretariat in Riga: Mara Uzule-Springe, tel. +371 67095256, fax: +371 67027475 e-mail: mara.uzule-springe@pvd.gov.lv

Objectives

The objectives of the seminar are to elucidate the following issues:

- The importance of *Culicoides* spp.
- Climatological changes; influence on habitat
- Population size of vectors
- Vectors of importance for animal disease in the Nordic-Baltic region; general status
- Possible ongoing research and investigations.

Target groups

The seminar addresses personnel with special responsibilities (experts) in preparedness and contingency work. This includes:

- veterinarians employed by national governments designated to handle animal disease emergencies;
- scientists and diagnosticians from national reference laboratories;
- veterinarians employed by the livestock industry responsible for disease prevention, control and eradication;
- private veterinarians providing services to farmers and designated to provide assistance to the veterinary authorities during disease emergencies.

Table 6: Programme for the vector seminar

Time	
13 October	Arrival of participants
11:30–13:30	Registration
12:00–13:30	<i>Lunch</i>
13:30	Opening session (A representative of the Nordic – Baltic Veterinary Contingency Group and Dr. Mareks Samohvalovs – Director General of the Food and Veterinary Service of Latvia)
Session I	Bluetongue and general issues related to the trends and possible changes in distribution and importance of vectors
	Chairman: Edvins Olsevskis, Latvia
14:00	Effect of climate on arbovirus occurrence with particular reference to bluetongue Speaker: Dr. Philip Mellor, UK
14:45	Global changes and emerging human infectious diseases Speaker: Dr. Elisabeth Lindgren, Sweden
15:30	<i>Coffee break</i>
16:00	Climatological changes and influence on habitat and population size of vectors <i>Speaker: Dr. Richard Wall, UK</i>
16:45	Vectors of importance to animal health in the Nordic-Baltic region; present situation and possible future trends Speaker: Dr. Rene Bodker, Denmark
17:30	Discussions of issues related to session I
18:00	Closing of session
19:30	<i>Dinner</i>
14 October	
Session II	Vectors in the Nordic Baltic region; general status and possible ongoing research and investigations
	Chairman: Dr Joakim Holmdahl, Sweden
08:30–11:40	Each country is given approx. 20 minutes to present a report on general status and possible ongoing research and investigation regarding vectors of importance for animal health Speakers: Denmark: Dr. Rene Bødker Estonia: Dr. Arvi Raie Finland: Dr. Lena Huldén Latvia: Dr. Gunita Jaunbauere Lithuania: Dr. Marius Masiulis Norway: Dr. Inger Sofie Hamnes Sweden: Dr. Jan Chirico
11:30–11:50	<i>Coffee break</i>
11:50–12:20	Artropod born virus in Northern Europe with special refernce to epidemiology, zoonotic aspects and needs for training Speaker: Dr. Olli Vapalahti
12:20–13:15	Discussions of issues related to sessions II: conclusions and recommendations
13:15	Close of the seminar
13:30	<i>Lunch and departure</i>

Abstracts from invited speakers

Climatic effects on arbovirus disease occurrence with special reference to bluetongue

By Dr. Philip S. Mellor – Vector-borne Diseases Programme, Institute for Animal Health, Pirbright Laboratory, Ash Road, Pirbright, Woking, Surrey, GU24 0NF, UK

The presentation will begin with a brief description of bluetongue virus (BTV), the disease it causes in its ruminant hosts and the insect vectors that transmit it. The talk will then move on to highlight those climatic variables that are likely to influence the distribution and incidence of vector-borne diseases like BTV and will include an explanation of how each of these variables may induce its own particular effects.

As a model of how climate or weather can have the above effects, I will then describe recent changes in the world distribution of BTV and its vectors, focussing on the epizootics in and around Europe from 1998 until 2009. It will be argued that these recent changes, in virus and vector distributions and in the species of vectors transmitting the virus, can be linked to climate-change.

A summary of what this might mean for the future, in a time of on-going climate-change, will be provided and practical ways of controlling or minimising the effects of the disease will be described.

Global environmental changes and emerging infectious diseases in humans

By Dr Elisabet Lindgren – Division of Global Health/IHCAR, Karolinska Institute, Sweden

Human activities increasingly affect the structure and functioning of ecosystems. In turn, these changes can influence the entire chain of factors involved in the infectious disease cycle: pathogens, vectors, reservoir species and human populations. Seemingly unrelated human activities can thus have serious consequences for human diseases, both infectious and non-infectious. The multi-faceted and complex linkages between global environmental change (including climate change, land and sea use change, global biodiversity loss and change, global socio-economic change) and human health need to be better understood.

The increasing interconnectiveness of today's world, in terms of travel and trade, contributes to a rapid spread of pathogens, disease vectors, reservoir species, and infected animals and humans around the globe. This plays a major part in the creation of pandemics, in changes in the geographical distribution of infectious diseases, as well as in the emergence of new diseases, in particular when combined with the impacts of global environmental changes, like climate change.

About 75% of the new diseases that have affected humans over the past 10 years have been caused by pathogens originating from an animal or from products of animal origin. Many of these diseases have the potential to spread through various means over long distances and to become global problems.

Insects and ticks, as well as many parasites, are directly sensitive to temperatures as they have no thermostatic regulation of their own. Climate, in terms of ambient temperatures and length of the different seasons, is the ultimate limiting factor for the geographical distribution of many vectors and parasites. Climate change has over the last two decades contributed to changes in the latitude and altitude distribution of disease vectors world-wide. In Europe the northern distribution limit of the disease-transmitting *Ixodes ricinus* tick has changed markedly since the beginning of the 1980s, observations that are correlated to changes in climate variables (studies from Sweden). During the same time period ticks, as well as human cases of Lyme borreliosis and tick-borne encephalitis, have changed their altitude distribution drastically in the mountainous regions of the Czech Republic.

Climate change will interact with other factors, such as changes in land use, demographic and socio-economic factors, and contribute to outbreaks of water- and food-borne diseases, and to changes in the geographical distribution, seasonality, and incidence of several vector- and rodent-borne diseases in Europe and the Nordic countries. The magnitude and nature of such climate change impacts depend on local vulnerability, including local resilience to such changes and the adaptive capacity of nature, the society, and the human population.

The climate will continue to change over the coming decades regardless of mitigation measures. Thus, society and the animal and health sectors will have to adapt to the consequences of climate change. National vulnerability, risk and adaptation assessments are essential for the understanding of potential health impacts and

adaptation needs at the local level. Cross-sectoral collaboration is important, in particular between the veterinary and human health sectors.

The Nordic countries and the Baltic region share many biogeographical, climatic and epidemiological conditions. Diseases do not respect borders, and with a rapidly changing world, the need for collaborations between countries will be increasingly important for early detection of new threats to the region, such as the introduction and establishment of new vectors, reservoir species, and pathogens.

Arthropod vectors of disease: climate, environment and control

By Dr. Richard Wall – Veterinary Parasitology & Ecology Group, School of Biological Sciences, University of Bristol, UK

Arthropod borne diseases have a major impact on animal health and welfare and, in many cases, also on human health. Many arthropod borne diseases are also expected to increase in prevalence as a result of changing social habits, habitat modification, exotic vector introductions and climate change.

Global climate change predictions suggest that far-ranging effects may occur in the population dynamics of arthropod vectors, provoking fears of widespread increases in disease incidence and production loss. However, several mechanisms may act to mitigate the effects of increased parasite development rates at higher temperatures, preventing dramatic rises in overall levels of disease. These include concurrent temperature-driven increases in mortality rates, and more rapid acquisition of host immunity at higher infection pressures. Crucially, increased abundance of parasite infective stages will only lead to increased levels of infection and disease if they coincide with availability of susceptible hosts. Changes in husbandry that are driven either by climate change directly or by changes in the perceived risk of parasitic disease, could therefore counteract predicted climate-driven effects on arthropod abundance.

However, the sensitivity of farmers, veterinarians and pet owners to changes in arthropod abundance and risk of disease will determine their ability to react quickly and appropriately to altered epidemiological patterns. This will be affected by parasite distribution, the relationship between burden and disease, and the effort diverted to surveillance of disease or rates of infection. Optimum strategies for disease management will be very system-specific and depend on detailed understanding of interactions between climate, parasite abundance, host availability and the cues for and economics of intervention.

There is an urgent need to establish effective surveillance systems for most arthropod borne diseases across different countries to allow a detailed risk analysis, including the evaluation of the potential spread to new areas or the new introduction of exotic species or disease agents. This will require a clear and exhaustive knowledge on the distribution of arthropod borne diseases in different areas, an understanding of the diagnostic limitations for arthropod borne diseases and standardization of techniques among reference laboratories in different countries. Continuous monitoring of insecticide resistance and the development of management strategies to minimise its onset are also essential.

Ultimately, it is probable that approaches which attempt to reduce vector abundance or treat hosts with chemotherapy alone are unlikely to be effective in the long term. More suitable approaches may include the greater use of a range of mutually compatible options in integrated management programmes.

Vectors of importance to animal health in the Nordic-Baltic region; present situation and possible future trends

By Dr. Rene Bodker – National Veterinary Institute, Denmark

Data collected by Scandinavian weather stations during the last 30 years show an increasing temperature trend and climatologists predict the trend will continue and accelerate as a result of increasing concentrations of carbon dioxide in the atmosphere. The prevalence and diversity of vector borne diseases are overall positively correlated with warmer climates. Global warming may therefore be a potential threat to humans, life stock and wild animals by facilitating the establishment of new vectors and diseases in the Nordic region and in similar areas presently protected by cool climates.

However the Nordic as well as the nearby Baltic area cover a wide range of temperatures from northern Norway to southern Denmark. Even when assuming pessimistic warming scenarios northern parts of Scandinavia will remain cooler than present day Denmark, where vector borne diseases have not been a major veterinary or public health concern for many decades. Average climate data predicted by climate scenarios ignores the random fluctuation in temperature from day to day and from year to year. This variation is substantial and for long periods during particular warm years the Nordic area already experience temperatures comparable to the future average temperatures as predicted by internationally recognised climate scenarios. These warm periods have not caused large outbreaks of vector borne diseases in the Nordic area. Never the less vector borne diseases appears to be moving north in Europe. The extraordinary rapid spread of bluetongue virus type 1 and 8 to France and Scandinavia respectively, suggests a potential for vector borne disease in Scandinavia. Clearly the relationship between climate and vectors and the diseases they carry is not a simple one.

In order to predict future trends in vectors and vector borne diseases in the Nordic-Baltic area we *need* more sophisticated models than just simple correlations with average temperatures from climate scenarios. These models may be based on significant statistic relationships between present disease distributions and climate variables recorded from the areas where the disease is present and absent today – sometimes referred to “climate matching models”. Or models may be mathematical models based on a biological understanding of the impact of climate parameters on the most important physiological and ecological processes related to disease transmission and vector biology.

Statistical models do not require a detailed understanding of biological or ecological processes. Using a climate scenario for a specific area like Southern Scandinavia, we can simply identify an area with this particular set of climate variables today and observe the present vectors and diseases in this area. Assuming the area only differs from southern Scandinavian in respect to climate, we would then predict that southern Scandinavia would acquire these vectors and diseases if the climate changes according to the predicted climate scenario. This appears to be an appealing method, however it has important limitations e.g. we may not be able to identify a present area with the same combination of climate variable values as we predict for future southern

Scandinavia. But the most important limitation is the assumption that the two areas only differs with respect to climate.

Misuse of this method has led some journalists to the belief that global warming will lead to widespread malaria epidemics in northern Europe. But climate is not the only determinant of diseases e.g. socioeconomic status is an equally important factor for the distribution and intensity of vector borne diseases. And warm but wealthy areas like Florida and Singapore have much lower incidence of vector borne diseases than do cool mountain areas in e.g. tropical Africa.

A special type of statistical analysis is the temporal trend analysis. When vectors or infections move northwards year by year, we may estimate the speed of the annual northward movement. It is tempting to extrapolate this trend into the future to estimate when the vector or disease will reach e.g. the Nordic-Baltic region. However, extrapolating trends beyond the existing data is a highly speculative approach, although it sometimes proves surprisingly accurate, e.g. the bluetongue epidemic northern spread in Western Europe.

Detailed mathematical models appear a better choice for predicting the impact of climate change on vectors and vector borne diseases in the Nordic-Baltic area. Mathematical models simulating actual biological processes guide us a better understanding of the biology of vectors and diseases. And reliable models allow us to develop cost efficient targeted surveillance programs and design protective strategies. Developing simulation models even allow us to experiment with different outbreak control strategies. But contrary to statistical models, mathematical models demand extensive quantitative knowledge of biological processes, knowledge we unfortunately often do not have.

A number of potential vectors and vector borne infections pose a new or increasing risk to animals and humans in a warmer Nordic-Baltic region. Especially tick borne infections like Anaplasma, Babesia, Borrelia and TBE are moving north or are increasing in prevalence. Sandflies, the vectors of leishmania parasites, may at least temporarily establish populations during exceptionally warm weather. The Asian tiger mosquito is another vector on the move. Mosquito borne infections like West Nile virus, Tsetse virus and filarial infections are also likely to move north from their present strong holds in southern Europe.

Zoonotic arboviruses in Northern Europe

By Dr. Olli Vapalahti – University of Helsinki, Finland

Flaviviruses and alphaviruses are globally the most important arboviruses. Flavivirus tick-borne encephalitis virus (TBEV) and alphavirus Sindbis virus (SINV) infections are the most important in Northern Europe. In addition orthobunyavirus infections (such as Inkoo virus infection) occur, but no mosquito-borne flaviviruses have previously been found.

The study of Finnish mosquitoes by virus isolation in cell cultures and subsequent viral antigen screening using flavivirus-specific antibodies resulted in novel flavivirus isolates of which we have recently described Lammi virus (LAMV) (Huhtamo et al., J. Virol, 2009) while no West Nile and related viruses have been found in our studies, these viruses occur in Southern or central Europe.

TBE occurs within a wide geographical zone extending from Western Europe to China and Japan. There are three main lineages of TBEV, the European, Siberian and Far Eastern subtypes. The European lineage (TBEV-Eur) is transmitted by *Ixodes ricinus* (present in Western, Central and Northern Europe) and the latter two (TBEV-Sib and TBEV-FE) by *I. persulcatus* extending from Eastern Latvia and Estonia to Japan. In Finland, only *I. ricinus* had previously been reported, but we have found that in western Finland, *I. persulcatus* prevails and TBEV-Sib occurs. TBEV may also cause disease in dogs and horses.

Sindbis virus (SINV) is member of genus *Alphavirus* in the family *Togaviridae*. SINV was first isolated in the 1950s in the Nile Delta in Egypt from *Culex* mosquitoes, without a link to a human disease and is the causative agent of Pogosta or Ockelbo disease (in Finland and Sweden, respectively). Pogosta disease (PD) is manifesting as rash-arthritis in August–September, characteristically as large outbreaks (e.g. thousands of cases in 1995) with a seven-year periodicity in Finland. We recently isolated for the first time the causative agent of PD from acute PD patients in 2002. SINV is widely spread in Africa, Eurasia and Australia, but symptomatic infections in humans have been diagnosed only in few geographically restricted areas, such as Northern Europe, and occasionally in South Africa (where symptomatic infections in horses have been recently described), Australia, and China. During the last decades, however, symptomatic disease has almost solely been reported in Northern Europe.

Other alphaviruses cause similar diseases, e.g. Chikungunya virus has recently caused a massive outbreak in countries at the Indian Ocean.

Monitoring and research on vectors in Sweden

*By Dr. Jan Chirico — Department of virology, immunobiology and parasitology,
National Veterinary Institute, Uppsala, Sweden*

In order to determine the presence, distribution and seasonal activity of Bluetongue vectors, *Culicoides* are monitored with Onderstepoort blacklight suction traps since 2007. Potential vector species are widely spread thorough the country, even above the Polar circle. *Culicoides obsoletus* is present and the dominant species in all areas investigated except in the most northern location, Abisko (N 68° 20' 56.40"; E 18° 44' 56.07").

In general, population levels vary considerably between years. At present we are analyzing data to determine similarities in the distribution of species and their relation to temperature. No activity of *Culicoides* has been observed indoors in animal facilities during the winter period.

In relation to the interest and importance of climate change there is an increase of proposals and applications for research on arthropod vectors and vector-borne diseases. Previous and suggested research on ticks and tick-borne diseases with particular reference to the transmission of the bacterium *Anaplasma phagocytophilum* in relation to climate zones in Sweden will be presented. Ongoing and planned research on other arthropod vectors will also be presented and discussed.

Entomological Surveillance of Bluetongue in Estonia in 2009

By Dr. Arvi Raie – Chief Specialist at the animal health office, Veterinary and Food Board, Estonia

The basis for our entomological surveillance program is the EU Council's directive nr 1266/2007, issued on 26 October 2007. According to this regulation our main goals were:

- to obtain field data for refinement of the distribution map of the vector species *Culicoides spp* for Estonia;
- to determine the seasonal occurrence of the vector insects;
- to determine the vector-free periods.

Results of the entomological surveillance of bluetongue

We started with surveillance of bluetongue in 2008, studying serologically randomly collected blood samples of 996 bovines and 54 sheep. They were all negative in the ELISA test.

In 2009 we planned to examine 2,000 blood samples collected from bovines. By 1 July 2009 we had tested 774 blood samples from 82 herds. In addition we tested, both serologically and by PCR, all the bovines, sheep and goats that were imported from risk areas for the virus. According to our current test results we can assure that Bluetongue virus has not been isolated in Estonia, and thus we have maintained the disease-free status.

Methods of entomological surveillance

In Estonia entomological surveillance is coordinated by the Veterinary and Food Board. Collection the vector insects and sending the samples for testing is done by animal welfare specialists at the county veterinary centres.

To carry out entomological surveillance eight light-traps were acquired in 2008. We started collecting samples in spring 2009. Light-traps were put up in eight counties. Sites where light-traps were installed should be nearby a farm with a herd of at least 10 bovines or sheep and have natural water source and electricity supply for collecting samples. It was also essential that the farmer would consent to setting up the trap and cooperate in collecting the samples. The light-traps were set up in the border counties and on 2 of our largest islands.

Setting up light-traps and collecting samples

Light-traps was placed 1,5–2 meters from the ground. When collecting samples we measured the highest and lowest temperature during the day and located the trap with GPS. A white beaker with 200 ml of soap solution was attached to the trap. The light-trap was turned on 1 hour before sunset and turned off after sunrise.

The sample was extracted by using a tea strainer and a piece of fine gauze. The gauze with the insects was placed into a screw-lid container with 70% ethanol. The

samples were sent to the Veterinary and Food Laboratory in Tartu with an accompanying letter.

Results of entomological laboratory tests

By September 2009 the Veterinary and Food Laboratory had identified *Culicoides obsoletus*, *Culicoides pulisaris* and few other *Culicoides spp* species. The largest amount of insects belonging to the *Culisoides spp* were found in Viljandi and Parnu counties at the end of July and in the beginning of August. In one sample, taken on 5 August 2009, 47 957 specimens of *Culicoides obsoletus* were found. The large numbers of insects can be attributed to the warm weather and prolonged periods of rain in the second half of the summer. The weather was warm until the middle of September. Only after the first cooler nights at the end of September the numbers of vector insects started to drop to the average of 100 specimens per sample. For example the sample collected on 28 September 2009 in Polvamaa contained 11 vector insects. After a sudden drop in temperature at the beginning of October the number of vector insects dropped, and it is quite safe to say that soon the vector-free season will begin.

Bluetongue vector control in Lithuania

By Dr. Marius Masiulis – Acting director of the Animal Health and Welfare Department, State Food and Veterinary Service, Lithuania

Black flies and biting midges are wide spread through Europe. Within the biting midges family only midges of genus *Culicoides* feed on the blood of warm-blooded vertebrates. Bluetongue occurs almost worldwide and is transmitted by approximately 30 species of biting midges of the genus *Culicoides*.

In Lithuania, only a small fraction of black flies species have been recorded. Investigations of black flies and biting midges in Lithuania started 10 years ago. 26 species of black flies and 24 species of biting midges of genus *Culicoides* are known to be present in Lithuania.

Investigations have shown that the dominant species of *Culicoides* in Lithuania are *C. obsoletus* group, *C. grisescens*, *C. impiiunctatus* and *C. punctatus*. It has been demonstrated that flying activity of *C. obsoletus* group and *C. grisescens* starts in April when the air temperature reaches 15 °C. The flying activity of *C. punctatus* starts in the middle of May while flying activity of *C. impunctatus* and *C. segnis* starts in the end of May.

The *C. obsoletus* group and *C. punctatus* can be collected until the end of October when the air temperature is 9 °C. The vectors activity of *C. obsoletus* come to 4 generations per season, *C. punctatus* 3 generations per season and *C. impunctatus* to 2–3 generations per season (Bernotiene et al., 2002).

Status and ongoing research in vector borne diseases in Denmark

By Dr. Rene Bodker – National Veterinary Institute, Denmark

Research in vector borne diseases of animal and humane importance is a new field at the DTU National Veterinary Institute. But the outbreak of bluetongue, that reached Denmark in the fall 2007, has prompted this research area to “re-emerge” at the institute. At the time of the bluetongue outbreak the Section for Epidemiology was moving into the field of spatial modelling of veterinary diseases and spatial modelling remains the focus of our research activities in vector borne diseases.

Although our focus is on spatial modelling we realise that models need parameter estimates. This is why we have started both descriptive and experimental field work. This summer the focus has been on short range dispersal of host seeking Culicoides.

The Veterinary Institute was appointed the National Reference Centre for Culicoides in 2007. We have been monitoring the Culicoides free periods in Denmark since autumn 2007. Because research is required to be an integrated part of all activities at the institute, the most important task for the reference laboratory is not so much to identify Culicoides species, but to interpret and present the collected data, advise the veterinary administration and to develop procedures for collections of supplementary data with a focus on meteorological and environmental data. Presently the reference laboratory also deals with other vector borne diseases e.g. in a recent outbreak of TBE in humans north of Copenhagen, we collected the infected ticks (first record of TBE on Zealand).

The National Veterinary Institute heads a national joint research program with three other universities. One of the main objectives of the project is to develop a national spatio-temporal model for Culicoides density at farm level and a similar model for bluetongue R_0 (based on vectorial capacity). The project also develops molecular techniques for identification of Culicoides, and test vector control techniques. One of the partners, the Danish Pest Control at Aarhus University, also does research on host preferences of Culicoides in an independent project.

The National veterinary Institute heads two small projects funded by the Nordic Council: One joint project with partners in Sweden, Norway and Finland is examining various aspects of bluetongue entomology and climate change in Scandinavia. The other project is aiming to identify potential climate change driven emerging vector borne veterinary diseases and zoonoses in the Nordic area.

The institute is a member of MedReoNet and the new EpiZone BT-DYNVECT and a partner in a new nationally funded Ph.D. project on bluetongue spread modelling.

The virology section at the institute (Lindholm) is involved in both outbreak and routine surveillance and development of new diagnostic procedures, and has recently established a bluetongue challenge model in cattle.

Vectors in Finland; general status and ongoing research and investigations

By Dr Lena Hidden – Department of Forest Ecology, Faculty of Agriculture and Forestry, University of Helsinki

The Finnish Food Safety Authority EVIRA, the Museums of Natural History and the Department of Forest Ecology, University of Helsinki began to monitor *Culicoides* in Finland in 2007. During the first years the collecting sites were situated only in the south part of the country. In the beginning of September 2009 fieldwork was also done at the Reindeer Research Station in Kaamanen, northern Lapland.

Only 25 species of *Culicoides* and four possible vectors have been found in Finland. All species were known before the regular monitoring started. The most important vector species in Finland would be *C. obsoletus* and *C. scoticus*. *C. obsoletus* is frequent in the whole country but the populations in the south parts of the country are much smaller than in Lapland. *C. grisescens* is also a common species. It is not a known vector, but should be observed during a possible outbreak of bluetongue.

The ecology of Finnish *Culicoides* is poorly known, but the lack of funding has so far made more extensive research projects impossible. One important project is comparing different light traps with traps that use CO₂ and octenol (MosquitoMagnet). The light conditions in Finland during the warm season affects the light traps and the material from them cannot be used for statistical analyses.

The *Culicoides* in the South Finland become active in the end of April or in the beginning of May. There is a smaller spring top and the main top is usually in August. The flight continues until the late October. The light trap starts collecting after the middle of July. The situation in Lapland is even worse. The sun is above the horizon for about two months. The MosquitoMagnet trap collected 90% more *Culicoides* than the light traps in the collection in Lapland the first week in September 2009.

Another project analyses the frequency of *Culicoides* caught in the wind. A large Finnish project by MTT Agrifood Research Finland, monitored the migration of insect pests to Finland with suction traps and sticky strip, runs from the end of April to the end on June 2007–2008. The material did not contain any specimen of *Culicoides*. The insect material from an older project, that monitored migrating aphids in Finland during the 1960s to beginning of 1980s, has also been preserved. It monitored the whole season and will give information about possible *Culicoides* species caught in wind traps in August and September. The extensive Finnish wind trap material could also be used to analyse the variation of *Culicoides* caught in the wind from over a period of several decades. The determination of the material is dependent on future funding.

Important vectors in the spread of terrestrial animal disease in Norway

By Dr. Inger S. Hamnes – National Veterinary Institute, Section for parasitology, Oslo, Norway

The major vectors related to the spread of animal diseases in Norway are ticks (*Ixodes*) and biting midges (*Culicoides*). Ticks are vectors for *Anaplasma phagocytophilum*, *Babesia divergens*, *Borrelia burgdorferi* and *Culicoides* are vectors for Bluetongue virus.

General status

Ixodes ricinus is common along the Norwegian coast from the Swedish border to the southern parts of Nordland county and is occasionally reported from more northern parts and inland areas.

Tick-borne fever ("sjodogg") in sheep caused by *Anaplasma phagocytophilum* is of major concern in Norway. It is estimated that 300,000 sheep are infected by tick-borne fever each year. A number of cattle also get tick-borne fever (141 in 2006) and *Anaplasma* has been isolated from sick young roe deer and a young moose. Piroplamosis in cattle, caused by *Babesia divergens*, occurs in areas with *Ixodes ricinus*, but is usually not a problem. Outbreaks, however, occur from time to time.

Other tick borne pathogens have been reported in several animal species in Norway (horses, dogs, and wild cervids).

Culicoides: Bluetongue virus serotype 8 was detected in Norway in February 2009 and was confirmed in 34 animals in 4 cattle herds. As a part of the national surveillance and control programme for Bluetongue, entomological surveillance of *Culicoides* has been ongoing since 2007. Norway do not vaccinate against BTV.

Twenty-one species of *Culicoides* has been reported from Norway. It is assumed that at least 40 species occur. A number of new species (to Norway) has been identified in samples from the entomological surveillance programme (not published). Potential vector species are prevalent in most parts of Norway and in large numbers. *Culicoides obsoletus*, *C. scoticus*, *C. chiopterus* and *C. pulicaris* have been demonstrated as far north as Troms County (Mehl, 1996).

The potential vector species associated with outbreak of bluetongue in northern Europe all occur in Norway, *C. dewulfi* being the less prevalent than the others. 89–96% of the caught *Culicoides* belongs to the potential vector species. Between 0–270,000 *Culicoides* midges in samples (Onderstepoort Blacklight traps, 24 hrs catch period). *Culicoides obsoletus* (3) was detected as early as the end of March (indoor, 2009). In 2007, parous *C. obsoletus* midges were caught as late as 21 November.

Research

Ongoing projects:

- project on deer ked (*Lipoptena cervi*); might have potential as vector of *Bartonella* species;
- examination of samples in existing collections of biological material at the National Veterinary Institute with regards to selected tick borne pathogens;
- “ticks and keds”; observations of ticks and deer keds on wild cervids by hunters;
- “improved welfare in sheep production – preventive measures, disease resistance and robustness related to tick-borne fever in sheep”.

Future projects:

- application for barcoding project on *Culicoides*,
- *Culicoides* research; will participate in application(s) for the current EMIDA call.

References

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Research of Bluetongue vectors in Latvia

By Dr. G. Jaunbauere and I. Rodze – National Diagnostic Centre of Food and Veterinary Service

The scientific project "Distribution, quantitative parameters and biological individuality of *Culicoides* species as vectors of Bluetongue in Latvia" were realized in the period from 2006 till 2009. The project was run by the Scientific Institute of National Diagnostic Centre. The main objectives of this project were to:

- detect diversity of *Culicoides* species;
- detect *Culicoides* distribution depending of climatic conditions;
- calculate period free of actively flying midges.

Seven to 14 black light traps were evenly set up in Latvia. They were located near cow and sheep sheds to observe the influence of climate conditions (the strength of wind, precipitation, night temperature) to the activity of vectors.

Overall 72% of midges belonged to the *Obsoletus* complex and 27% to the *Pulicaris* complex. Only 1% of collected midges were non vector species. The maximum of midge flight was observed form the end of May till the beginning of June and in the beginning of July. A positive correlation ($r= 0,44$, $p<0,05$) between amount of *Obsoletus* complex midges and night average temperature was observed. The correlation ($r= -0,43$, $p<0,05$) between amount of *Obsoletus* complex midges and wind speed was negative.

Food and Veterinary Service was regularly informed about the results of the project. The results were presented at different international conferences. At national level veterinarians, biologists and other experts were informed in different conferences and seminars.

Evaluation

Table 7: People and the % who responded to the question

General questions	1	2	3	4	5	Number of people who have responded to the survey
Did the seminar meet your expectations?		6 (13%)	20 (47%)	17 (40%)		43
Did you feel you had the necessary prerequisites (knowledge skills etc.) to be able to benefit from the seminar?		6 (14%)	18 (41%)	20 (45%)		44
Was the level of the seminar satisfactory?		5 (12%)	19 (43%)	20 (45%)		44
How did you find the supplied material, abstract handouts, etc.?	4 (10%)	9 (20%)	16 (36%)	15 (34%)		44
Was the seminar relevant for you?	1 (2%)	2 (4%)	24 (55%)	17 (39%)		44
Over all, how did you find the seminar?		5 (12%)	19 (43%)	20 (45%)		44

Table 8: People and the % who responded to the question

Evaluations of main speakers	1	2	3	4	5	Number of people who have responded to the survey
Effect of climate on arbovirus occurrence with particular reference to bluetongue. Speaker: Dr. Philip Mellor, UK			15 (34%)	29 (36%)		44
Global changes and emerging human infectious diseases. Speaker: Dr. Elisabeth Lindgren, SE	-	-	-	-	-	-
Climatological changes and influence on habitat and population size of vectors. Speaker: Dr. Richard Wall, UK		12 (27%)	12 (27%)	20 (46%)		44
Vectors of importance to animal health in the Nordic-Baltic region; present situation and possible future trends. Speaker: Dr. Rene Bodker, DK	1 (2%)	5 (12%)	17 (39%)	12 (27%)	9 (20%)	44
Arthropod born virus in Northern Europe with special reference to epidemiology aspects and needs for training. Speaker: Dr. Olli Vapalahti, FI		2 (5%)	3 (7%)	11 (29%)	23 (59%)	39

Complementary comments to evaluation form

Positive:

- The people in charge of the seminar did a very good work and were very helpful.

Negative:

- difficult to read/see the pictures and hear/understand what some of the speakers said. The text was too small. In the handouts the pictures were too small and should have been in color, some tables and slides are worthless without color;
- too much focus on BT. It would have been interesting to have more information about other vector-spread diseases ex. African Horse Sickness and West Nile

Fever. It would also have been interesting with more clinical aspects etc. Now mostly entomology.

What was the best part of the seminar?

- the first presentation by Philip Mellor. Many new good points, the speech directed to colleagues. Good overview of the risks and the challenges of bluetongue in Northern Europe;
- many good questions from the participants. Discussions and brief dialogues with colleagues/participants from other countries;
- each country presentation;
- in general the seminar was very good and relevant;
- hotel, meals and service was very good!
- share the scientific information about the vectors activity;
- very good balance of research and applied epidemiology.

What could be improved?

- something about vaccination and antibody response. Methods for antibody testing. Why do we see animals vaccinated and revaccinated having no antibodies in ELISA;
- more practical aspects regarding monitoring, surveillance or control of the vectors;
- I wished to have information regarding investigation of seroprevalence of BTV in various countries; not all speakers advised that;
- presentations of varying quality, difficult to hear some speakers, to many were talking about the same subject;
- the room and placing of tables to be able to see/read the presentations;
- the ventilation could have been better;
- the handouts should be printed in color;
- add addresses and e-mail to the participants.

Other suggestions:

- invite a speaker from ex. South Africa. They are very experienced in fighting against vectorborn diseases and infections in wild animals;
- continue the Nordic – Baltic seminars, organize seminars with regular frequency. country presentations could be shorter;
- the speakers should have focused on different species; most speakers talked about bluetongue/culicoides surveillance;
- invite some practitioners to share the information;
- maybe include poster session to show more of ongoing scientific work.

List of participating experts

Table 9: List of participating experts

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The organizing Committee

The vector seminar was organized by the Nordic-Baltic Veterinary Contingency Group having the following members:

- Jessica Eriksson-Lofgren: Evira, Finland
- Ardo Pakkonen: Veterinary and Food Board, Estonia
- Edvins Olsevskis: Food and Veterinary Services, Latvia
- Egidijus Pumptis: State Food and Veterinary Services, Lithuania
- Joakim Holmdahl: Swedish Board of Agriculture, Sweden
- Hanne M. Hansen: Veterinary and Food Administration, Denmark
- Camilla Brach Andersen: Veterinary Food and Administration, Denmark
- Jørgen Westergaard: ADC-consult, Denmark (Employed by the organising committee as private consultant)
- Audur Arnthorsdottir: Food and Veterinary Authority, Iceland
- Eivind Liven: Food Safety Authority, Norway

Edvins Olsevskis, Joakim Holmdahl, Jørgen Westergaard and Eivind Liven were the executive committee, well assisted by Mara Uzule-Springe at the Headquarter Food and Veterinary Services in Riga.

Seminar on National Contingency Plans and Response to Animal Disease Emergencies

Tallinn, 16th and 17th of December 2008.

Abstract: National veterinary contingency plans contain information on disease eradication strategy, resources available, infrastructure, the veterinary organization during emergency situations and cooperation with partners and stakeholders. The report has focus on all elements relate to disease suspicions, disease confirmation and carcass disposal, and operation of disease control centres.

<i>Seminar on National Contingency Plans and Response to Animal Disease Emergencies</i>	<i>77</i>
Editorial preface	78
Acknowledgement	79
Conclusions and recommendations.....	79
Programme for the Seminar on National Contingency Plans and Response to Animal Disease Emergencies	82
Abstracts from invited speakers*	85
List of participating experts	102
The organising committee	104

Editorial preface

The Nordic Council of Ministers – the forum for parliamentary cooperation between Nordic countries – adopted in 2006 a strategy plan which included cooperation within Nordic-Baltic veterinary contingency planning. A Nordic-Baltic Veterinary Contingency Group was subsequently established. The objectives of this group include, within the area of contingency planning, in the Baltic and Nordic countries to:

- organise training courses, seminars and workshops;
- make arrangements for simulation exercises for testing of contingency plans;
- enhance disease awareness and control measures with special reference to exotic animal diseases.

Contingency planning is to make arrangements in advance for an event that may or may not happen, in particular an event that would cause serious problems if it did happen. In the context of infectious animal diseases, the event would be the introduction of an exotic disease such as foot and mouth disease, avian influenza or classical swine fever. The veterinary legislation of most European countries includes requirements for the presence of contingency plans. A contingency plan shall specify the national measures required to maintain a high level of awareness and preparedness and to be implemented in the event of a disease outbreak. An adequate contingency has the resources and the legal and administrative framework to put all the required resources into use immediately upon the suspicion of disease.

In pursuit of the established objectives and related to the experiences from Nordic-Baltic simulation exercises, especially the "HOT-AIR" exercise in May 2008, the Nordic - Baltic Veterinary Contingency Group has organised the Seminar on National Contingency Plans and Response to Animal Disease Emergencies in Tallinn.

Approximately 60 experts, including professionals from official authorities, laboratory and university bodies, private sector and external speakers from Belgium and UK, attended the seminar. All eight Nordic-Baltic countries were represented.

The seminar gave the participating experts an excellent opportunity for reviewing national contingency plans prepared by national veterinary administrations of the Nordic and Baltic countries and for exchanging views on experiences gained from the application of contingency plans during eradication of devastating diseases such as foot and mouth disease, avian influenza and bluetongue. It is the hope that the excellent presentations and discussions during the seminar has provided valuable information and visions for further development of national contingency plans for the benefit of the livestock sector and consumers.

Oslo, August 2009

Nordic-Baltic Veterinary Contingency Group
Eivind Liven, Chairman

Acknowledgement

The Nordic-Baltic Veterinary Contingency Group wishes to thank the Nordic Council of Ministers for the financial support made available for the preparation and implementation of the seminar. The support has made it possible for national experts to meet in Tallinn under favourable conditions for valuable and fruitful discussions on many different issues of contingency planning important for the prevention, control and eradication of exotic animal diseases.

A special thank shall be addressed to the speakers for their excellent presentations, the chairmen managing the different sessions in a competent way and all the experts for their very active participation in the discussions and exchange of views on the many different elements of contingency planning.

The seminar would not have been a success without the valuable local support given by the Chief Veterinary Officer, Dr. Ago Partel and the staff of the National Food and Veterinary Board, Tallinn, Estonia. The support has been greatly appreciated.

Conclusions and recommendations

Conclusions

Outbreaks of exotic animal diseases (the OIE former list A diseases) such as foot and mouth disease, classical swine fever, avian influenza and bluetongue in any of the Baltic and Nordic countries may have a devastating impact, not only on the livestock sector and the rural community in the directly affected areas, but also beyond agriculture and nationwide. The risk of introducing pathogens causing exotic diseases and the spread of the agent within a country depends on a number of factors including:

- import controls;
- disease awareness;
- biosecurity applied at holdings by livestock producers;
- movement of animals and animal products.

An important instrument in the preparation for and handling of the occurrence of exotic animal disease outbreaks is an adequate contingency plan.

The seminar showed that all the Baltic and Nordic countries had adopted contingency plans for exotic animal diseases and good progress had been achieved during the last 5–10 years with regard to the development of such plans. The threat of well described exotic diseases and of emerging diseases, however, remains and they all pose a great danger to the Nordic-Baltic livestock population and a challenge to the competent veterinary authorities.

The presentations made during the seminar formed an excellent basis for exchange of views between the experts from the participating countries. The different elements

of contingency plans were reviewed in a comprehensive way and the objectives of the seminar were satisfactorily achieved.

Recommendations

Based on the discussions and exchange of views the following recommendations were made.

1. Disease suspicion

The competent authority shall, in the case of a suspected outbreak of an exotic notifiable disease such as avian influenza, foot and mouth disease, classical swine fever and bluetongue immediately set in motion an investigation to confirm or rule out the presence of disease in question. The seminar noted that difficulties may occur with regard to getting:

- livestock owners familiar with the symptoms and signs of notifiable diseases;
- some livestock owners and veterinarians to report the suspicion of an exotic disease.

It is recommended that the Nordic-Baltic Veterinary Contingency Group makes arrangements for the preparation of a document which elucidates the situation with regard to suspicions of certain important exotic diseases during the period 2005–2007. The document should provide information on suspicions recorded, confirmation of suspicions and the recorded differential diagnosis when a suspicion had been ruled out.

2. Disease surveillance

It is essential to detect an introduced exotic disease as soon as possible and before it has chance to spread. It was noted that both the PRRS outbreak in 2007 and the bluetongue in 2008 in Sweden were detected in surveillance programmes and not as clinical diseases.

It is recommended that the Nordic-Baltic Veterinary Contingency Group initiates an exchange of relevant surveillance programmes and the results of such programmes between the countries in the Nordic-Baltic region.

3. Stamping-out

The Stamping-out policy is applied for a number of exotic animal diseases. This policy calls for culling of animals under appropriate animal welfare conditions and disposal of dead animals in such a way that the pathogen causing the disease is eliminated or inactivated and in a manner that limits its spread.

It is recommended that the Nordic-Baltic Veterinary Contingency Group examines the desirability of developing a catalogue which describes the equipment available in the Baltic and Nordic countries for application of the stamping-out policy.

4. Disease outbreak management

Proper record keeping during disease outbreaks is of paramount importance for:

- in-depth analysis of epidemiological data;
- evaluating the effectiveness of the disease outbreak management procedures;
- a swift and adequate payment of compensation to farmers.

It is recommended that the Nordic-Baltic Veterinary Contingency Group provides assistance in the development of a guide for a log system to be used under disease emergencies.

5. Requirement of resources

It was noted that while the crisis situation in relation to e.g. traffic accidents and outbreak of fire usually would be of a relative short period of time (hours/days) the crisis situation caused by exotic diseases might last for weeks and even months.

It is recommended that the contingency plans adopted by the Nordic and Baltic countries should continuously be reviewed with the objective of calculating the need for resources, in particular personnel, in the event an epidemic should be prolonged and for the ready movement of personnel between countries.

6. Work during crisis

The principles of the planning and organizing of contingency work in relation to outbreaks of infectious diseases in terrestrial animals and fish were discussed.

It is recommended that during a crisis situation:

- crisis should be dealt with in a way that is as similar as possible to the normal procedures;
- crisis should be handled at the lowest possible level within the organization, but with good communication between all levels.

7. Disease awareness and training

Prompt and accurate notification can only be achieved if the veterinary profession and stockowners are aware of the danger of exotic diseases and are conversant with the signs and symptoms of the disease. The Nordic and Baltic countries should maintain awareness of exotic diseases both within the veterinary profession and in the agricultural community. Biosecurity measures should be encouraged, advertised and implemented by farmers.

It is recommended that the Nordic-Baltic Veterinary Contingency Group within the context of disease awareness and training promote the recognition on an annual "Exotic animal diseases day".

8. Inter-Nordic-Baltic cooperation

The seminar recognized the importance of exchange of views and discussion amongst veterinary experts working at central and regional level within the framework of contingency planning.

It is recommended that the Nordic-Baltic Veterinary Contingency Group in connection with future seminars, workshops and simulation exercises makes allowances for the participation of contingency planning experts working at different levels in the veterinary services to enhance cooperation and that special attention should be paid to cooperation between personnel working in border areas to neighboring countries.

9. Communication

The importance of a well-planned communication strategy within the context of contingency planning was emphasized by the participants of the seminar.

It is recommended that special attention should be given to the topic of communication during the up-dating of contingency plans adopted by the Baltic and Nordic countries.

Programme for the Seminar on National Contingency Plans and Response to Animal Disease Emergencies

- Time: 16–17 December 2008
- Place: Nordic Hotel Forum, Viru valjak 3, Tallinn, Estonia Phone: +372 622 2900 www.nordichotels.eu
- Secretariat in Tallinn: Mr. Rene Pillesson; rene.pilleesson@vet.agri.ee

Objectives

The objectives include:

- to review national contingency plans for exotic animal diseases;
- to exchange views on experience gained from the application of contingency plans during eradication of avian influenza, foot and mouth disease and bluetongue epidemics in Europe;
- to be familiar with the content of contingency plans adopted by the Nordic-Baltic countries;
- the exchange views on the further development of contingency plans.

Target groups

The groups include:

- veterinarians employed by national governments and designated to handle animal disease emergencies;
- scientists and diagnosticians from national reference laboratories;

- veterinarians employed by the livestock industry responsible for disease prevention, control and eradication;
- private veterinarians providing services to owners of cattle, small ruminants, swine and poultry and designated to provide assistance during disease emergencies.

Table 10: Programme

Time	
15 December	
Arrival of participants	
16 December	
09:00–09:15	Registration
09:15	Opening session (Eivind Liven, Norway and Ago Pärtel, CVO, Estonia)
09:30	Why Contingency planning? Speaker: Sten Mortensen, Denmark
Session I	
Disease suspicion and confirmation Chairman: Raimond Strastin, Estonia	
10:00	Contingency planning in Iceland. Focus on disease suspicion Speaker: Halldor Runólfsson by Iceland
10:30	Contingency planning in Sweden. Focus on disease confirmation and depopulation of infected holdings Speaker: Bengt Larsson, Sweden
11:10	<i>Coffee break</i>
11:30	Contingency planning in Lithuania. Focus on disposal of animals Speaker: Egidijus Pumputis, Lithuania
12:00	Contingency planning in Finland. Focus on record keeping and methods for payments of compensation to farmers Speaker: Taina Aaltonen and Hanna Lounela, Finland
12:45	<i>Lunch</i>
Session II	
The requirements related to resources, chain of command, communication and training Chairman: Kristine Lamberg, Latvia	
14:00	Contingency planning in Denmark. Focus on resources (personnel, equipment, services) and requirements to contracts Speaker: Maren Holm Johansen, Denmark
14:40	Contingency planning. The chain of command from a Chief Veterinary Officers point of view. Speaker: Ago Partel, Estonia
15:10	Contingency planning in Norway. Focus on communication (internal and external) Speaker: Knut Ronningen, Norway
15:45	<i>Coffee break</i>
16:00	Contingency planning in Estonia. Focus on emergency vaccination Speaker: Ardo Pakkonen by Estonia
16:30	Contingency planning in Latvia. Focus on training. Speaker: Edvins Olsevskis, Latvia
17:00	Discussions and closing of sessions of day 1.
19:00	Dinner at the hotel restaurant.
17 December	
Session III	
The use of contingency plans during outbreaks and simulation exercises Chairman: Jessica Lofgren Erikson	
08:30	Experiences gained from operating a local disease control centre during the FMD epidemic in 2001 in the UK and the value of the available contingency plan Speaker: Leonard Mansley, UK
09:15	Handling of AI and Bluetongue epidemics; the use of contingency plans and short comings detected Speaker: Philippe Houdart, Belgium
10:00	Discussions
10:15	<i>Coffee break</i>
10:45	Experiences gained from the Bluetongue Simulation Exercise “Hot Air” conducted in 2008 by the Nordic-Baltic Countries Speakers: Eivind Liven, Norway and Philippe Houdart, Belgium
11:15	Exonaut: A tool to facilitate preparation and implementation of simulation exercises Speaker: Joakim Holmdahl, Sweden
11:30	Discussions of issues related to sessions I, II and III

Time	
Session IV	Contingency planning and potential diagnostic tools for the future Chairman: Eivind Liven, Norway
12:00	Exchange of views on the future of contingency plans
12:30	Conclusions and recommendations
13:15	Close of seminar
13:30	<i>Lunch</i>

Abstracts from invited speakers¹

Why contingency planning?

By Dr. Sten Mortensen – head of disease control and contingency planning. Danish Veterinary and Food Administration

Common objectives for their animal health policies for the states in Europe include the protection of human health, safeguarding the economy and farmers and promotion of free trade in animals and animal products. Outbreaks of disease can cause fast transmission of disease and thus a disruption of trade and food production, economic problems for farmers and rural communities, and interference in the normal procedures of the food industry, regular food control and the veterinary services. These elements all together can fuel disbelief, anxiety, anger, fear and frustration among large groups of stakeholders involved in animal production.

The Veterinary Services should be able to provide leadership in such circumstances by e.g. having contingency plans in place with the aim to quickly and efficiently eliminate the problem and restore normal production and control practices.

Elements in successful disease control includes that every individual and key player has an idea of his/her role in this exceptional situation, the campaign has well know objectives, strategies, measures and procedures and flexible tools. One should realize that two disease events are rarely alike and fully predictable. Therefore a certain level of creativity, flexibility and confidence in unconventional ways of solving problems should be envisioned.

Many countries have organized their veterinary contingency plans as a general document describing the possible strategy and resources available for disease control (disease control strategy and measures, legal base, financial instruments, line of command, crises management plan, physical locations for national and local disease control centres, personnel resources, labs, training and exercises, public awareness, e.t.c.) and a series of operational manuals for specified diseases including draft legislation, forms and disease specific procedures to be followed.

Technical objectives can be specified for each of the different phases during outbreaks, i.e. the high risk period before detection of the first case, the period from the first outbreak to efficient disease control procedures have been put in place and the final screening phase. Specific goals (i.e. 4 hour response time to notified suspicions; 24/48 hour killing of animals on infected farms/dangerous contact farms; 8 days for completion of cleaning and disinfection) are crucial for decision support. These goals may also be used to calculate the resources required in the contingency plans simulation of realistic/worst case disease outbreak scenarios.

¹ The information provided in the abstracts was during the seminar supported by PowerPoint presentations. A paper copy of the presentations was made available to the experts upon arrival at of the seminar.

Contingency planning in Iceland; disease suspicion

By Dr. Halldor Runolfsson – Chief Veterinary Officer and director of the office of animal health and welfare, Icelandic Food and Veterinary Authority

Objectives

The aim of the presentation is to highlight the importance of early and secure notification of suspected animal diseases.

Main principles

Each country must have a specific legal acts on the control of animal diseases. The main chapters of such an act should focus on the following issues:

1. Purpose of the act:

- promotion of good animal health
- prevention of new contagious foreign diseases being brought to the country
- monitoring and surveillance of animal diseases
- eradication of diseases
- maintenance of healthy livestock that can be used to produce wholesome food products.

2. Notification of suspected animal diseases:

The responsibilities of the main actors in the notification must be clear in the legislation for example in a contingency plan for:

- animal owner
- general public
- police
- laboratories
- private practitioners
- district Veterinary Officers
- chief Veterinary Officer.

3. Control of animal diseases:

- the powers given to the Veterinary Service
- compensation for control measures of certain diseases
- legal text for dealing with non – compliance of control measures.

Contingency planning in Sweden; disease confirmation and depopulation of infected holdings

By Dr. Bengt Larsson – head of disease control strategies, Department of animal welfare and health, Swedish Board of Agriculture

According to the epizootic ordinance the Swedish Board of Agriculture (SBA) has the power and the obligation to combat disease under the epizootic law. Presently there are about 30 diseases covered by the act. The ordinance also states that the main other authorities involved, i.e. National Veterinary Institute (SVA), National Food Administration and the County Administrations (n=21) should have contingency plans approved by SBA. These plans are general and not related to specific diseases. In addition, there is a specific contingency plan set up by SBA for each of the major disease in accordance with the EU legislation.

It is essential to detect an introduced exotic disease as soon as possible and before it spread. Alert veterinarians that know what they should do if they encounter suspected cases of exotic diseases are important. The use of adequate surveillance programmes when there is a high risk for a country to be infected is also important. In fact, both the PRRS outbreak in 2007 and the Bluetongue in 2008 in Sweden were detected in surveillance programmes and not as clinical diseases. The PRRS could therefore be eradicated by using stamping out of the only 7, possibly 8, herds that were infected.

Of course there is a need to have reliable diagnostics, preferably those recommended by OIE and/or EU and make use of reference laboratories. Diagnostics must be performed rapidly and during night if needed. A suspected FMD or CSF cannot wait too long.

Since living infected animals are a source of infection to other animals, control measures for certain diseases involve depopulate as soon as possible. This must be done in a way that prevent the spread of disease and be in accordance with animal welfare rules.

Contingency planning in Lithuania; focus on disposal of animals

By Dr. Egidijus Pumputis – Deputy head of centre for contingencies and contagious diseases, Veterinary Services, Lithuania

Strategies for the disposal of dead animals should be prepared for any emergency. Major issues related to the disposal of dead animals include the number of animals involved, bio-security concerns over the movement of infected or exposed animals, people and equipment, environmental concerns and the psychological distress experienced by farmers and animal handlers.

Cooperation between the Veterinary Service and other relevant government bodies is necessary for developing a coherent set of legal measures for the disposal of dead animals in advance of any emergency. Mass killing and disposal of animals in the event of a disease outbreak or disposal of animals in the event of natural disasters such as floods, usually must proceed with the minimum delay. The success is determined by the structures, policies and infrastructure established, and by the critical elements which need to be considered in planning and implementation. Early detection of new infections, immediate killing of infected animals and rapid removal of the dead animals with inactivation of the pathogen are important.

Disposal should be organised in such a way that the workers are safeguarded against the risks of handling decomposing dead animals. Special attention should be given to zoonotic aspects. The disposal procedure should be selected to result in inactivation of the pathogen. Different methods of the disposal of dead animals have different effects on the environment. Temporary storage of dead animals in cold stores may relieve a lack of processing capacity.

Adequacy of funding for the options chosen must be ascertained and committed at the earliest possible stage. Availability of sufficient and well trained staff resources in particular for extended and /or large operations should be ensured. This is particularly important for technical and inspection personnel who are usually in short supply. Social acceptance is important in choosing a disposal method. Also, farmers will be sensitive to the safety measures taken to prevent spread of the disease by the disposal method selected and the transport of the dead animals to the disposal site.

Adequate compensation of owners for the loss of animals or for burial or burning sites will improve acceptability. Equipment used in the disposal of dead animals can transfer infection to other premises. When disposing of dead animals, full attention should be given to preventing scavengers and vectors from gaining access to dead animals, which might cause spread of disease. The method of disposal used has a significant bearing on the economic impact. Possible methods for the disposal of dead animals include composting, burial, biogas production and bio-refining.

The disposal of large numbers of dead animals will be expensive. The costs will vary with the choice of the disposal method. Each method used will give negative effects on the environment, local economies, producers, and the livestock industry. In addition to bio-security considerations, decision makers need to understand the economic, social, environmental protection and aesthetic impact of various disposal technologies. It

therefore requires a comprehensive understanding of any array of dead animal disposal technologies and must reflect a balance between the scientific, economic, and social issues at stake. Timely slaughter, maintenance of security and prevention of further spread of disease are the essential considerations in terms of disease control.

Focus on record keeping and methods for payments of compensation to farmers

By Dr. Tania Aaltonen – Finnish Food Safety Authority, Evira

Having access to valid databases and records is essential for successful disease outbreak management. Finnish veterinary services uses databases and records in placing restrictions on animal holdings, tracing contacts, creating zones and identifying holdings in zones. Both the national and the provincial disease control centers have access to the registry of animal holders, animal registries, geographical information system and Elite. Additional information can be obtained from private enterprises. Meteorological data and calculations are provided by the Finnish Meteorological Institute when needed. The challenges in using records are the reliability of information and the proficiency of staff in using records. Emphasis should be put on educating stake holders about the importance of accurate and timely record keeping and training members of veterinary staff.

During an outbreak records have to be kept at disease control centers regarding all phone calls, actions taken and decisions made. Forms are available for recording the measures taken on each individual farm involved.

Prompt, justified and reliable payment arrangements are a precondition for guaranteeing the reporting of notifiable diseases to veterinary authorities. If producers cannot rely on compensation, there is a risk that cases will go unnotified. This applies not only to the value of animals ordered to be destructed, but also other losses. In many countries, animals that are killed due to diseases are well compensated but when it comes to production losses the situation may be worse. Indirect losses, however, may be much higher than the direct losses. Various mechanisms are used to compensate the losses in different countries.

In Finland the losses due to the eradication of the most serious diseases are compensated by state. This concerns both direct and indirect losses. For certain less serious diseases, there are insurances available.

Contingency planning and resources

By Dr. Maren Holm Johansen – Danish Veterinary and Food Administration

The issue “resources” is very important and often underestimated in contingency planning.

Overall there must be at least three different aspects when we deal with the resource issue:

- personnel resources
- demands to equipment
- services and contracts requirements.

With reference to personnel resources it is important first to have an idea of where to allocate veterinary staff. Second to know where to get technical and administrative help. If such a plan does not exist, it is impossible to escalate the disease control fast enough to control the outbreak.

The demand to equipment is another issue. The experience in Denmark is that it might be hard to get sufficient supplies of a specific item when the outbreak is ongoing. It is therefore important in contingency planning, to have sufficient equipment in stock or at least to know where to get it things in a hurry.

In conclusion it is beneficial to have contracts on personnel allocation, equipment supplies and services (e.g. weather – modulations) in a strategy and resources plan. This plan could be either a general plan covering all diseases or a special appendix to each plan.

Contingency planning; the chain of command from a Chief Veterinary Officers viewpoint

By Dr. Ago Partel – Director General, Chief veterinary Officer, Veterinary and Food Board, Estonia

Chain of command during suspected or confirmed outbreaks should enable hundreds of hopefully right decisions to be taken under serious time constraint coordinating human and technical resources for efficient eradication.

Ago Partel described Estonian legislative basis enforcing Veterinary and Food Board and CVO powers enacting the contingency plans, implementing quarantine measures and protection and surveillance zones, interactions between the CVO, state and local disease eradication commissions, Police Board, Rescue Board and Border Guard. Practical implementation of these powers and interaction between institutions was described through Newcastle disease outbreak that was efficiently eradicated in October–November 2007.

Especially critical are the first two days including official confirmation of the outbreak, meetings of disease control commissions with all relevant authorities, implementing quarantine measures and defining zones, notifying neighbours, EC, OIE, press communication and starting the practical activities like culling, disposal, emergency vaccination etc.

Last but not least the CVO has also a key role in defining all refundable losses and communicating these to the government and European Commission. It was concluded that during disease outbreak suspicion and eradication sound legal basis and practical cooperation, understanding and communication at all levels is crucial. However paper and reality never overlap 100% – legislation and contingency plans should enable flexibility and be updated in peacetime. Simulation exercises are the best way to keep different structures aware and discover weaknesses.

Contingency planning in Norway, focus on communication

By Dr. Knut Ronningen – Norwegian Food Safety Authority

Communication is an important part of any crisis and good communication routines, both internal and external, are key factors to a successful handling.

Communication during a crisis must be proactive, and any contingency plan must include a plan for how to handle the communication challenges. It is important to underline that communication skills are trainable, and must therefore be an integrated part of any simulation exercise.

Contingency work in Norway is based upon the following principles:

- any crisis should be dealt with in a way that is as similar as possible to the normal procedures;
- crisis should be handled at the lowest possible level within the organization.

The purpose of internal communication is to enlighten and elucidate the crisis, ensure the carrying out of measures and to motivate and taking care of the personnel. Communication must be 2-ways, as open as possible and leaders must be knowledgeable and have the necessary understanding about communication. Internal staff must always be informed about external information.

Target groups of the external communication are the stakeholders, other official authorities, supporting institutions and the public. Based on different characteristics and roles of the various parties involved, communication has a set of challenges.

Good understanding of the actual situation, the creation of strong alliances and at least to avoid “ambush” or criticism in public are crucial communication factors in the handling of any crisis.

Contingency planning in Estonia with special attention to emergency vaccination

By Dr. Ardo Pakkone – animal health officer, Veterinary and Food Board, Estonia

According to Infectious Animal Disease Control Act the Veterinary and Food Board (VFB) prepares contingency plans which are approved by the Director General of the VFB. Contingency plans are published in the webpage of VFB. The VFB is a governmental agency carrying out its tasks under the Ministry of Agriculture and consists of a central office and 15 local veterinary centers in the counties. The central office has 5 departments. The VFB employs currently 350 people with 112 in the central office and 238 in the county veterinary centers.

Emergency vaccination in Estonia. Until the outbreak of Newcastle disease in November 2007 Estonian VFB followed a non-vaccination policy to control especially dangerous infectious animal diseases in the whole country. The National Infectious Animal Disease Control Committee (NIADCC) can propose to the Ministry of Agriculture to use vaccination if suspicion of an especially dangerous infectious animal disease is confirmed and the disease spreads extensively. The proposal must list the possible reasons for using vaccination and should also contain a vaccination programme.

Important elements of the Newcastle disease outbreaks and emergency vaccination in 2007:

- newcastle disease virus was found in wild pigeons;
- the first outbreak was in Viljandi county in July and August 2007;
- the disease was found in Tallegg in November 2007;
- the proposal of vaccination from VFB proposal was not accepted;
- a decision for emergency vaccination was taken;
- compulsory vaccination across the country from January 2008; until April 2008 covered by the state; later the vaccination costs were covered by the owner.

Details from the vaccination programme for emergency vaccination in Estonia in case of the Newcastle disease outbreak in Tallegg in November 2007

- area: 3 km zone;
- species and age of animals: Approx. 140000 young layers and 100 birds in 6 private households;
- primary vaccination: From 6–8 November 2007;
- secondary vaccination: From 21–23 November 2007;
- vaccine used: NOBILIS ND C2 and NOBILIS ND Clone 30;
- vaccination method: Spraying.

Contingency planning in Latvia; focus on training

By Dr. Edvins Olsevskis – Food and Veterinary Services, Latvia

Training is a very important component of the contingency plan. Regular training of personnel involved in disease outbreak management helps people to be well prepared in controlling disease outbreaks. Training must be given to different categories of personnel including veterinarians, veterinary inspectors and representatives from other institutions involved in epizootic disease outbreak management.

With the purpose to ensure notification of disease suspicion to veterinarian and of the veterinary services, it is also important to inform animal owners and other relevant stakeholders about ongoing training programmes. To achieve this aim the Food and Veterinary Service (FVS) regularly issues different informative materials (booklets, leaflets, posters etc.).

Different types of training activities are provided by the FVS. General training programmes are determined in National Training Concept that is approved every year by the Director General of the FVS.

Specific training elements on actions to be taken in case of epizootic diseases are organized each year as:

- simulation exercise; They are organized each year and include theoretical and/or practical training of veterinary inspectors from all territorial structural units of the FVS; the aim of such exercises is to train people, evaluate national contingency plans and to give suggestions for improvement;
- real time alert exercise; They are organized in one particular region (holding, slaughterhouse etc.) to check preparedness of veterinarians and other involved persons to act in case of disease suspects.

Experiences gained from operating a Local Disease Control Centre (LDCC) during the FMD epidemic in 2001 in the UK and the value of the available contingency plan

By Dr. Leonard (Sam) Mansley – Scotland, UK

Introduction

The first case of FMD in the UK in 2001 was confirmed on 20 February by which time it is estimated that animals on as many as 200 farms in 12 separate geographic locations were infected and incubating disease.

The spread of infection was successfully controlled nationally by 22 March, a relatively short space of time, and locally even sooner, e.g., by 17 March in southwest England and 15 March in southwest Scotland. This remarkable achievement could not have been achieved without the State Veterinary Service having been prepared, in no small part, through regular contingency planning exercises. However, inter-epidemic contingency planning and simulation exercises are expensive, there is usually little readily discernible cost benefit apparent, making them a soft target for short term cost savings driven by those with little knowledge and even less expertise in disease control procedures.

The UK control strategy for managing an epidemic is implemented at three levels; strategic, involving ministers and senior government officials; tactical, based in the national disease control centre (NDCC); and operational, the local disease control centre (LDCC). There is an alert system of white, amber & red, partners and stakeholders are included at each level and there is a formal annual review.

The EU provides useful guidelines and suggestions for the location, infrastructure and establishment of a LDCC. It is important to not only provide sufficient facilities and professional staff to support the proposed veterinary and technical structure, but also to ensure that sufficient, suitably trained and motivated administrative support staff are also deployed.

Lessons learned

During epidemics we learn many things, we find useful people and tools, and identify simple procedures to include in our planning ready for the next outbreak.

We must not underestimate the considerable resource requirement, one infected farm can easily trigger in excess of 100 veterinary visits; nor should we give up hope, in 2001 we faced over 9000 urgent jobs in the first 3 weeks and we survived and won. We shouldn't underestimate the significant levels of stress faced by our staff and it would be well to have a counselling system in place.

In “peacetime” things to know and do:

- support customs controls to prevent smuggling;
- ban waste food feeding to livestock, it's a time bomb;
- control livestock markets;
- control livestock dealers and hauliers;
- impose post-movement quarantine on farms;

- support national veterinary services;
- value and support contingency planning;
- value & train staff regularly: veterinary, technical and administrative.

In an epidemic:

- implement an immediate national animal movement ban;
- back it up by welfare slaughter schemes;
- implement the agreed control policy;
- be fast – slaughter, disposal, C&D, vaccination;
- enforce enhanced biosecurity measures;
- complete epidemiological investigations;
- complete real time analysis;
- keep control policy flexible;
- keep the press involved as good communications are essential.

The LDCCs first 24 hours are vital. You might want to have in place:

- a readiness and resource manager
- a national rapid response team (vet/tech/admin)
- detailed instructions
- contracts with outside bodies
- regular, recorded training for all staff
- dialogue and interaction with operational partners
- a contingency plan subject to regular review and testing
- contingency veterinarians

Beware instant experts: "I find it truly amazing, the number of foot-and-mouth disease experts (self-proclaimed) who appeared almost overnight." CVO Canada 1952. Avoid theoretical, unvalidated, disease simulation models, prepared by bio-mathematicians, containing improbable assumptions, especially veterinary. These were widely published and used to drive policy for the first time in a major disease epidemic in 2001.

Paul Kitching, former head of the FMD World Reference Laboratory, wrote in 2006: "The UK experience provides a salutary warning of how models can be abused in the interest of scientific opportunism".

Finally, when involved in contingency planning....EXPECT THE UNEXPECTED.

Belgian experiences with contingency planning

By Dr. Philippe Houdart – Director, Crisis prevention and management unit; Belgian Federal Agency for the Safety of the Food Chain, Belgium

Controlling or eradicating successfully an outbreak of an animal epizootic (the former OIE list A diseases) is the sum of a lot of factors. Contingency planning, that is preparing your organization for this adverse event, is one of the crucial elements of this sum. A good preparation will allow your organization to respond in a quick, efficient and standardised way to an outbreak, thus not only allowing it to gain valuable time in the initial stages of the control of the epizootic but also to, hopefully, shorten its course. Setting up a contingency plan is an essential part of this preparation.

A good contingency plan should collect all the necessary information about controlling the disease and present it to the reader in a clear, comprehensive and brief way. Since it is in the first place destined to the staff of your organization that will take part in the control of the epizootic, being it in the national or the local disease control centres, the plan should always be adapted to your own situation, chain of command, competences and responsibilities. More so, if structured and written well, it will also be the tool by excellence to inform the stakeholders and staff from other services or institutions about your intentions.

However well a contingency plan may be set up, it is not a guarantee for success. Often, after the initial stages, an epizootic will take a different path than the previous one and present a challenge that has not been taken into account in the plan. If that is the case, one has to rely on the flexibility of the organization to cope with this new situation.

Nowadays, following more or less the guidelines set out by the European Commission, most member states have opted for a general contingency plan that is supplemented with several operational manuals. The former document collects all the information about the topics that are shared by all epizootics, indiscriminative of the disease involved. Amongst others can be cited: the legislation, financial aspects, including the valuation and preparation of a dossier for cofmancing, the chain of command and the roles for all different players involved, the communication both within the organization and with the other services and stakeholders. The operational manuals will complete the general plan with the details to cope with the specific disease or situation. They will cover amongst others a risk analysis and the operational approach in every phase of the control (outbreak abroad, suspicion, outbreak and closing down stage), give a fact sheet and describe detailed procedures for the epidemiological enquiry, sampling, diagnosis, depopulation and destruction, cleaning and disinfection, tracing and prioritizing the traced contacts.

Finally, all plans should be made available on an easy to reach place (e.g. website or internal network) and should be revised regularly and in any case after each exercise or real life event.

Experiences gained from the Bluetongue Simulation Exercise "HOT-AIR"

By Dr. Eivind Liven – Senior consultant in the Norwegian Food Safety Authority; chairman of the Nordic-Baltic Veterinary Contingency Group/Planning group of the exercise

Objectives

With the aim of testing national contingency plans, the objectives of the exercise were to focus on:

- Inter-Nordic-Baltic activities related to
 - communication
 - administration of cross border zones
 - trade
- National activities related to national conditions and demands
 - field and laboratory activities, slaughterhouses and livestock markets
 - establishment of zones
 - vaccination

Principles

The national simulation exercise was carried out in principally 3 ways -A central table top exercise:

- a table top exercise involving different levels of the competent authority – An exercise including practical field work, sampling and laboratory testing both in official and private sector.

Experiences gained

The experiences gained and the achievements made are in more detail presented by Dr. Philippe Houdart. The overall conclusions from the planning group are as follows:

Within the frame of an international concept the respective countries also established a programme that should meet their national needs and demands. The training elements were all relevant to their actual situation. For all countries, except for Denmark, the timing of the exercise related to the actual threat of bluetongue, was optimal. All countries have gained experiences that enabled them to improve their bluetongue contingency plans and thereby be better prepared for future outbreaks of the disease. The engagement and the enthusiasm from personnel involved is a bonus factor in addition to other achievements.

The involvement of seven countries was a demanding element in the exercise. Trans border activities during the exercise proved to be on a much lower level than expected. As reported by the external evaluator, this outcome is due to several reasons, including different organisations and general communication issues. In general, however, it feels correct to underline that the challenges related to international

cooperation, when disease control measures in one country also involve neighbouring countries, should not be underestimated.

The planning group had decided to make it possible for the various countries to take the advantage of a special IT-based programme for the purpose of standardised monitoring, and later evaluation, of the exercise. Sufficient resources were not used to derive the advantages from such a trans-border steering system.

To be able to establish the necessary prerequisites for coordinating disease control measures in crises situations of importance in the Nordic-Baltic region, organisational issues, communication, as well as coordination of common training programmes, should be discussed.

Exonaut – A web based tool for facilitating exercises

By Dr. Joakim Holmdahl – Veterinary Inspector, Section of international affairs and contingency planning, Swedish Board of Agriculture

Pre-prepared contingency plans are essential for handling a crisis situation. However, it is equally essential to have stakeholders and participants aware of the plans and to have the capacity and incentive to update these plans to reflect the current situation. This is most effectively achieved by conducting simulation exercises.

Simulation exercises are crucial for testing existing contingency plans and making the necessary changes. In the exercise the evaluation should meet the objectives of the exercise.

A method should be established to preserve lessons learned to enable alteration of existing contingency plans and make the planning for future exercises easier.

During the Nordic-Baltic bluetongue exercise in spring 2008 we used a web based tool, the Exonaut programme. This enabled the participants to solve many of the questions concerning a simulation exercise.

The program Exonaut allows for:

- distributed planning potential
- dynamic play
- faster planning process
- joint training capability
- share specific exercises with other organizations
- re-using of already conducted Exercises/Events/ Incidents

List of participating experts

Table 11: Participants

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The organising committee

The programme for the seminar was developed by the Nordic-Baltic Veterinary Contingency Group. This group is established within the responsibility of the Nordic Council of Ministers, with the objective to coordinate contingency planning and preparedness work related to infections animal diseases in the Nordic-Baltic region.

The committee established to organise the seminar consisted of:

- Eivind Liven, Norway, Food Safety Authority
- Ardo Pakkonen, Estonia, Veterinary and Food Board
- Rene Pilleson, Estonia, Veterinary and Food Board
- Raimond Stastin, Estonia, Veterinary and Food Board
- Jørgen M. Westergaard, Denmark, ADC-Consult

Nordic-Baltic Seminar on Risk Based Animal Health Surveillance and Contingency Planning

Reykjavik, Iceland, 1-3 September 2010

Abstract: A prerequisite for understanding changing local, regional and global distributions of animal diseases or disease risks is the rapid access to surveillance data that can enhance situational awareness of disease and of elements potentially linked with disease risk. The seminar highlighted concepts and methods of risk-based surveillance and on the use of modeling in animal health assessments.

<i>Nordic-Baltic Seminar on Risk Based Animal Health Surveillance and Contingency Planning</i>	105
Editorial preface	106
Acknowledgement	107
Observations and Conclusions	107
Recommendations	108
Programme for the seminar Nordic-Baltic Seminar on Risk Based Animal Health Surveillance and Contingency Planning	109
Target group	110
Abstracts from invited speakers	113
Evaluation	149
The organizing Committee	151

Editorial preface

The Nordic Council of Ministers adopted in 2006 a strategy plan which included cooperation within Nordic-Baltic veterinary contingency planning. The strategy plan emphasized that exotic animal infectious disease, with zoonotic potential as well as emerging diseases, should be prioritized.

A Nordic-Baltic Veterinary Contingency Group (N-B VCG) was established. The N-B VCG, as part of the Working Group responsible for Microbiology, Animal Diseases and Animal Welfare, has been working continuously with subjects that serve the objectives outlined in the strategy plan.

To achieve a common understanding of the risks related to the appearance of exotic infectious animal disease including zoonosis and emerging diseases among key personnel in the respective veterinary administrations and scientific institutions in the Nordic-Baltic countries the N-B VCG has prioritized:

- workshops and seminars
- simulation exercises
- training programs

N-B VCG has during the past years arranged a number of popular seminars on various topics. The seminars have had a large number of participants, as well as speakers from the Nordic-Baltic countries and other international experts. They have all played a vital role in making the seminars a success, this year was no exception. During the last seminar risk analysis were not only discussed but also demonstrated through an exercise. The practical demonstration was to my understanding much appreciated by the participants. This was just one example of all the topics that were discussed during the seminar.

The seminar was conducted in a friendly atmosphere, with excellent presentations from the speakers and an eager and enthusiastic audience.

The seminars play an important role in strengthening personal relations and networks but also in enhancing international communications during the control of epizootic diseases.

Jønkøping, December 2010

Nordic-Baltic Veterinary Contingency Group

Joakim Holmdahl, Chairman

Acknowledgement

The Nordic-Baltic Veterinary Contingency group wishes to thank the Nordic Council of Ministers for their financial support made available for the preparation and implementation of the vector seminar. The support has made it possible for national experts to meet in Riga to discuss the many subjects that arises in connection with the climate associated spread of vector borne animal diseases which has obtained increased interest also in the Nordic region of Europe.

A special thank shall be addressed to the speakers and their well-prepared presentation, the chairmen managing the different sessions in a competent way and all the experts for their active participation during the seminar. We are confident that these discussions and exchange of views will be beneficial to future contingency planning in the veterinary services in the Nordic-Baltic region.

The seminar would not have been a success without the valuable support given by the Chief Veterinary Officer of Iceland, Dr Halldór Runólfsson and the staff of the Icelandic Food and Veterinary Authority, MAST.

Observations and Conclusions

The World Trade Organisation (WTO) adopted in 1994 the Sanitary and Phytosanitary (SPS) Agreement. The agreement applies to all sanitary measures which may, directly or indirectly, affect international trade in livestock and products of animal origin. Its implementation has contributed to increased risk analysis work at the international level and in particular in countries with an industrialized livestock production. This increase was due to the fact that WTO Members may introduce or maintain sanitary measures which result in a higher level of sanitary protection than would be achieved by measures based on the relevant international standards, guidelines or recommendations in situations where:

- there is a scientific justification; Or
- the protection measures can be supported by an assessment which takes into account risk assessment techniques developed by the relevant international organizations.

Such assessment techniques have been published by the World Organisation for Animal Health (OIE), the World Health Organisation (WHO), and the European Food Safety Authority (EFSA) and by some Governmental institutions.

The Nordic-Baltic seminar has competently highlighted important aspects of risk analysis/assessment techniques related to available guidelines. In this context however it has been stressed that the guidelines developed for risk analysis work related to import of livestock and products of animal origin do not fully comply with the requirements for the assessment techniques necessary for a proper risk based surveillance programme.

The first day of the seminar focused on experiences gained from risk analysis work in different countries and on the application of risk assessments in National Veterinary Administrations and in Veterinary Contingency Planning in the Nordic and Baltic countries. The second day highlighted the value and importance of networks in the animal health area and the current situation with regard to training in risk analysis relevant for the veterinary world. All Nordic and Baltic countries were represented at the seminar; the participants, about 50, came from relevant scientific institutions, national food and animal administrations, and the private sector.

The seminar indicated the importance of conducting constructive dialogues and close cooperation between scientists, legislators, administrators and managers involved in the various parts of risk analysis work. It was emphasised that all actors were dependent on each other and that interaction and communication are prerequisites for successful results of risk analysis work. The institutes/agencies engaged in risk assessment at national level in the countries situated in the Nordic Baltic Region employ a rather limited number of persons with special training and qualifications in risk analysis and the participants of the seminar recognised with satisfaction the support provided by the Strategy Plan adopted by the Nordic Council of Ministers for enhancing veterinary contingency planning and giving the opportunity for professionals in the animal health sector in the eight (8) Nordic and Baltic countries for working together on many of the aspects related to risk analysis. The presentations made during the seminar provided an excellent basis for a valuable exchange of views between the experts from the participating countries. The outcome of this exchange is reflected in the recommendations stated below.

Recommendations

1. risk-based surveillance has been applied to important diseases such as avian influenza and Bovine Spongiform encephalopathy (BSE). However, internationally accepted guidelines for risk-based surveillance have not yet been developed/adopted. It is recommended that the veterinary administrations of the Nordic and Baltic countries encourage the preparation of such guidelines at the international level such as OIE and the EU;
2. different types of risk assessments – qualitative, semi-quantitative and quantitative – have been used within the context of contingency planning with the aim to horizon scan for animal health threats. The UK has since 2001 developed a simple Excel spreadsheet tool to give a semi-quantitative measure of the risks of disease introduction. It is recommended that the Nordic-Baltic Veterinary Contingency Group considers to make arrangements for conducting training courses on the use of the Excel spreadsheet model at regular interval (every 3rd year) for veterinarians in the Nordic and Baltic countries;
3. african swine fever (ASF) has in recent years spread to different parts of the Trans-Caucasian countries and into Russia. During that same timeframe, trade in livestock and products of animal origin between Member States of the EU and Russia has

increased. It is recommended that the Nordic-Baltic Veterinary Contingency Group conduct a feasibility study regarding risk of introduction of ASF in the Nordic-Baltic region; an assessment study which should include representatives from each of the countries in the region;

4. biosecurity refers to measures designed to reduce the risk of transmission of infectious diseases. Actions to be taken shall prevent spread of infectious diseases between regions, countries and herds (also within herds). Every person engaged in livestock production is responsible for observing reasonable levels of biosecurity. The level of biosecurity in a country is important for contingency planning at national level. The application of biosecurity measures at individual farms may in the near future play a role in the establishment of livestock assurance schemes.

It is recommended that the Nordic-Baltic Veterinary Contingency Group consider conducting a seminar or workshop aimed at analysing the biosecurity situation in the Nordic and Baltic countries. Such an analysis should apply a contingency planning perspective.

Programme for the seminar Nordic-Baltic Seminar on Risk Based Animal Health Surveillance and Contingency Planning

Organised by the Nordic-Baltic Veterinary Contingency Group:

- Time: 1–3 September 2010
- Venue: Radisson Blu Saga Hotel, Hagatorgi 107 Reykjavik Iceland
- Secretariat in Iceland: Audur Lilja Arnthorsdottir, Austurvegur 64, 800 Selfoss. Telephone: +354-5304837, +354-8402825. Fax: +354-5304801.

Objectives

The objectives of the seminar is to elucidate tools in risk analysis work and the elements of risk based animal health surveillance and contingency planning.

The seminar will focus on experience gained, needs and methods for strategic decision procedures at the national level, to improve and develop veterinary contingency planning on animal diseases.

Target group

The target group includes:

- persons/Institutions in the Nordic and Baltic countries involved in risk assessments, risk management and risk communication within the area of animal health;
- veterinarians employed by national governments designated to handle animal disease emergencies and food safety;
- scientists and diagnosticians from national reference laboratories;
- veterinarians employed by the livestock industry responsible for disease prevention, control and eradication;
- representatives of veterinary medical associations.

Table 12: Programme

Time	
1 september 2010	Arrivals and registration of participants Venue: Hotel Saga 2nd floor – Conference Lobby
19:00–20:00	Reception and registration of seminar/workshop participants
2 september 2010	Opening of seminar/workshop and seminar sessions I, II and III Venue: Hotel Saga 2nd floor– Harvard II
08:30	Registration of participants
09:00	Opening session: Dr. Joakim Holmdahl, Chairman of the Nordic– Baltic Veterinary Contingency Group
09:10	The Icelandic Food and Veterinary Authority (MAST) by Dr. Halldor Runolfsson, Chief Veterinary Officer, Iceland
09:30	Seminar session I: Experience of Risk Analyses Work Chairman: Dr. Audur Lilja Arnthorsdottir, Iceland Requirements to risk analysis and experiences gained from risk analysis work in Europe and the US. Guidelines for risk analysis National examples Experiences and common problems Speaker: DVM, PhD, Dr. med. Vet. Sc, Dr. Vet. Sc.h.c, Dipl. ECVPH Preben Willeberg, UC Davis
10:20	<i>Coffee break – Conference lobby</i>
10:40	Risk based surveillance (a) Science as a basis for risk based surveillance (b) Techniques Speaker: Prof. Dr. med. vet., PhD, Dipl ECVPH Katharina Stark, UK, the Royal Veterinary College
11:15	Risk assessments carried out by EFSA within the area of animal health Procedures for performing risk assessments Examples of completed risk assessments A comparison of National Risk Assessments and EU Risk Assessments Speaker: Dr. med. vet., PhD, Senior Scientific Officer Per Have, EFSA
11:50	Discussions related to presentations in session 1
12:00	LUNCH – buffet – Yale
13:00	Seminar session II: Application of Risk Analysis in the Veterinary Administration Chairman: Dr. Edvins Olsevskis, Latvia Risk analysis work related to recognition of disease free status after outbreaks The strength and limitations in risk analysis work Presentation of case study Speaker: DVM, PhD Sten Mortensen, Danish Veterinary and Food Administration

Time	
13:25	<p>A rapid qualitative risk assessment for use in Veterinary Administration; the DEFRA approach A generic spread-sheet tool for risk incursion A generic approach to identifying policy business needs Presentation of a case study Speaker: Dr. Helen Roberts, DEFRA</p>
14:10	<p>Swedish project regarding BT economy. Predicting costs for different scenarios. A tool for decision making. Speakers: Diana Viske, Bo Norell, Janne Johansson, Swedish Board of Agriculture</p>
14:50	<p>The approach to risk assessment in the Veterinary Administrations in Denmark, Estonia and Finland; each presentation 10 minutes. Speaker, DK: Dr. Sten Mortensen, Danish Veterinary and Food Administration Speaker, EE: Dr. Maarja Kristian, Veterinary and Food Board of Estonia Speaker, FI: Dr. Taina Aaltonen, Finnish Food Safety Authority, Evira</p>
15:20	<p><i>Coffee break – Conference lobby</i></p> <p>Seminar Session III: Application of Risk Analysis in Veterinary Contingency Planning. Chairman: Dr. Hanne Hansen, Denmark</p>
15:45	<p>Risk assessments as a tool in Veterinary Contingency Planning Speaker: DVM, PhD, Dr. Lis Alban, Danish Agriculture & Food Council</p>
16:10	<p>The approach to risk assessment in the Veterinary Administrations in Iceland, Latvia and Lithuania; each presentation 10 minutes. Speaker, IS: Dr. Audur Lilja Arnthorsdottir, Icelandic Food and Veterinary Authority Speaker, LV: Dr. Edvins Olsevskis, Food and Veterinary Service of Latvia Speaker, LT: Dr. Egidijus Pumputis, Food and Veterinary Service of Lithuania</p>
16:40	<p>A mathematical model for optimising prophylactic deworming strategies of companion pets moving from Echinococcus multilocularis endemic areas to countries free of infection Speaker: Epidemiologist, PhD. Rene Bødker, Danish National Veterinary Institute</p>
17:00	<p><i>Break</i></p>
17:15	<p>A web-based system for demonstrating space and time-space clustering of disease outbreaks (a) Foot and Mouth Disease (FMD) (b) Avian Influenza (AI) (c) Other diseases Speaker: DVM, PhD, Dr. med. Vet. Sc, Dr. Vet. Sc.h.c, Dipl. ECVPH Preben Willeberg, UC Davis</p>
17:40	<p>The approach to risk assessment in the Veterinary Administrations in Norway and Sweden; each presentation 10 minutes. Speaker, NO: Dr. Helga Høgåsen, National Veterinary Laboratory Speaker, SE: Dr. Ann Lindberg, National Veterinary Institute</p>
18:00	<p>Discussions of presentations related to sessions II and III</p>
18:10	<p>Close of sessions</p>
19:30	<p><i>Dinner (Íðnó Restaurant and Theatre, Vonarstraeti 3, 2nd floor, 101 Reykjavik, www.idno.is)</i></p>
3 september 2010	<p>Seminar Session IV and Workshop. Venue: Hotel Saga 2nd floor – Harvard II</p>
08:30	<p>Seminar session IV: Networks and training Chairman: Dr. Joakim Holmdahl, Sweden Experiences gained from the EPIZONE network The establishment of the network The operation of the network Speaker: DVM, PhD Armin Elbers, Central Veterinary Institute, Netherlands</p>
09:00	<p>The establishment of a network for the Nordic and Baltic Risk Analysis work in the area of animal health The present situation with regard to networks The requirements for a valuable Nordic and Baltic network. Speaker: Head of Section for Epidemiology, DVM., PhD., Dipl. ECVPH Claes Enoe, Danish National Veterinary Institute</p>

Time	
09:20	A brief review of training courses in the area of risk analysis for veterinarians in the Nordic-Baltic region. Speaker: DVM Camilla B. Andersen, Danish Veterinary and Food Administration
09:30	Discussions related to presentations in session IV
09:45	Conclusions, recommendations and closure of seminar by Dr. Joakim Holmdahl, Swedish Board of Agriculture
10:00	<i>Coffee break – Conference lobby</i> Workshop on application of the principles of rapid qualitative risk assessment for use in National Veterinary Administrations By: Dr. Helen Roberts and Dr. Mia Carbon, DEFRA
10:30	Introduction to workshop and establishment of working groups – Harvard II
11:00	Work on qualitative risk assessment case studies – Harvard 1, Harvard II, Oxford, Cambridge
12:30	LUNCH – soup and fish of the day – Yale
13:30	Working groups to complete case studies – Harvard 1, Harvard II, Oxford, Cambridge
14:30	Presentation of results and discussions of activities in working groups – Harvard II
15:00	Conclusions, recommendations and closure of workshop. – Harvard II

Abstracts from invited speakers

Requirements for risk analysis and experiences gained from risk analysis work in Europe and the US

Preben Willeberg – DVM, PhD, Dr. Vet.Sc, Dr. Vet. Sc h.c, Dipl. ECVPH, Senior Veterinary Global Health Specialist, Center for Animal Disease Modeling and Surveillance (CADMS), School of Veterinary Medicine, University of California, Davis, USA

Guidelines for risk analysis: Overall, the WTO-SPS agreement should be the international basis for guidelines in the animal and plant health and food safety areas. International guidelines for risk analysis intended for various relevant application areas are available: Import Risk Analysis for animals and animal,¹ trade in food and food products,² trade of animals and plants in general,³ and public health in general.⁴

Within the EU, EFSA has published general guidelines for risk assessments,⁵ in the US the competency is divided among USDA-APHIS, USDA-FSIS and FDA, each with their own guidelines.⁶

Only minor differences seem to exist among these international guidelines. The common philosophy is that risk analysis includes three main components:

- *Risk Assessment*—the scientific evaluation of biological risks and potential consequences
- *Risk Management*—the process of determining appropriate measures to reduce risk
- *Risk Communication*—the sharing of risk information

Risk analysis and risk-based surveillance: In contrast to risk analysis, risk-based surveillance has not yet been supplied with firm, internationally accepted guidelines and criteria. Nevertheless, the two are obviously related, and the results of one may be applied to proceed to the other: Risk-based surveillance ↔ Risk estimation ↔ Risk assessment.

E.g., for the purpose of making a risk assessment one might want to estimate the probability of an event from the results of a risk-based surveillance program; or one might estimate from a risk assessment the probability of an event in the population and its subpopulations in order to design and evaluate the sensitivity of a proposed risk-based surveillance system.

Risk analysis and contingency planning: A contingency plan is an important ingredient of Risk Management, since it should outline the available actions to manage an outbreak. Risk assessment outcomes are applicable to prioritize the need for contingency plans among various diseases, and the risk assessment process can be regarded as a tool in transmitting relevant scientific information to the contingency planning, e.g. on different scenarios with respect to populations, exposure and control.

Definition

$$\text{Risk} = \text{probability} \times \text{consequences}$$

Types:

Qualitative: High/medium/low
Semi-quantitative: Ranks, classes
Quantitative: Numerical estimates

Sources of estimates:

Assumptions
Expert opinions
Scientific reports
Current/historic data

Sources of deviations:

Uncertainty
Variability
Bias

Methodological issues:

Scenario trees
Simulation models
Sampling distributions

National examples

EU:

BSE
Trichinella
Echinococcus
Rabies

USA:

HPAI
BSE
Listeria, Salmonella, E. coli

Experiences and common problems

Transparency:

Data sharing
Peer review
Independence

Validity:

Specificity of data
Accuracy of assumptions,
Distributions & estimates

References

1. OIE Risk Analysis: Handbook on Import Risk Analysis for Animals and Animal Products. Vol.1 & 2, 2004.
2. FAO: Food Safety Risk Analysis. A guide for national food safety authorities. FAO Food and Nutrition Paper 87, 2006.
3. WTO: <http://www.vvto.org/english/tratop e/sps e/sps e. htm>
4. WHO Risk Analysis: <http://www.who.int/foodsafctv/micro/riskanalysis/en/>
5. EFSA: Opinion of the Scientific Panel on Animal Health and Welfare on the "Framework for AEFS AHAW Risk Assessments". The EFSA Journal (2007), 550, 1–46.
6. APHIS Risk Analysis: <http://www.aphis.usda.gov/is/sps/mod3/loverview.html>
7. FSIS Risk Assessment Models: <http://foodrisk.org/resource types/tools/FSIS RA Models/index,cfm>
FDA Risk Analysis: <http://www.foodrisk.org/>

Concepts and methods of risk-based surveillance

By Katharina D.C. Stärk, Barbara Häsler – Royal Veterinary College, London

Emerging animal and zoonotic diseases and growing international trade have resulted in an increased demand for veterinary surveillance. However, resources for government veterinary services are scarce world-wide and should be allocated efficiently. Risk-based surveillance has been proposed as a novel design to achieve cost-effective information collection in support of animal and public health risk management (Stark et al., 2006). The principal objectives of risk-based veterinary surveillance are to identify surveillance needs to protect the health of livestock and consumers, to set priorities, and to allocate resources effectively and efficiently. Risk analysis methods are used to achieve these goals.

Risk-based surveillance has been applied to various diseases and pathogens, most notably BSE and avian influenza, but also many other hazards such as *Trichinella*. The accumulating practical experience supports the continuing evolution and refinement of both the conceptual foundation as well as the implementation of risk-based surveillance.

The rapid rate of acceptance of risk-based surveillance, however, has to some extent outpaced the development of its theoretical bases. While progress has been made in terms of comparing the detection efficacy of risk-based and random sampling, for example, in relation to rare events (Presi et al., 2008) and the application of scenario tree modelling in the design of surveillance systems (Hadorn & Stärk, 2008), other methodological issues remain unresolved to date. Among these, the question of equivalence between risk-based and non-risk-based designs may pose a significant hurdle for further adoption.

An essential aspect of risk-based surveillance is the economic framework within which we assess the performance and value of surveillance systems. Evaluation of risk-based surveillance systems shall prove that their efficacy is equal or higher than that of traditional systems, and that resources are allocated efficiently. This should lead to more or better information given a certain level of resource input. Surveillance is ultimately used to inform decisions about which, if any, interventions are needed to contain a hazard in a population. Also, surveillance and intervention both use limited resources. The total benefit of surveillance and intervention of a hazard minus the cost of these activities will have to leave a positive difference (net benefit) to be economically justifiable (Figure 2). Due to the indirect and non-tangible nature of some benefits (e.g. increased reputation of an industry and enhanced market access), however, the amount of justifiable investment may not be easily determined.

Also, the optimal combination of resource use for surveillance and intervention cannot be answered in general and will have to consider the objectives of a programme, the nature of a hazard and the technical possibilities for its control.

In this context, risk-based surveillance is one of a number of possible designs to potentially achieve cost-effective information collection. Depending on the objectives

of a programme, the biology of the hazard and its frequency of occurrence, risk-based surveillance may be a smart solution. However, risk-based surveillance is more expensive to design and implement. Whether it is a smart design solution therefore needs to be considered in the context of the benefits gained and in comparison with alternative surveillance designs.

Risk-based approaches are currently emerging in the design of other resource-demanding activities such as microbiological controls, inspections of food business operators and interventions. It is anticipated that the risk-based approach will become a key element of food controls, including sampling, testing and inspection.

References

- Hadorn D, Stärk KDC (2008). Evaluation and optimization of surveillance systems for rare and emerging infectious diseases. *Veterinary Research* 39:57.
- Presi P, Stärk KDC, Knopf L, Breidenbach E, Sanaa M, Frey J, Regula G (2008). Efficiency of risk-based sampling versus random sampling for monitoring tetracycline residues in slaughtered calves in Switzerland. *Food Additives and Contaminants* 25:566–573.
- Stärk KDC, Regula G, Hernandez J, Knopf L, Fuchs K, Morris RS, Davies P (2006). Concepts for risk-based surveillance in the field of veterinary medicine and veterinary public health: A review. *BMC Health Services Research* 6:20.

Risk assessments carried out by EFSA within the area of animal health

By Per Have and Sandra Correia Rodeia – Animal Health and Welfare Unit, EFSA

The need for scientific advice in managing animal diseases and health topics has been recognised for many years. Thus, a Scientific Veterinary Committee was set up already in 1981 to provide scientific support for EU animal health control measures and legislation (Commission Decision of 30 July 1981 establishing a Scientific Veterinary Committee (81/651 /EEC)). In that decision the objectives of the Committee was of a consultative nature with particular reference to the cause, nature, pathogenesis, effects, diagnosis, epidemiology, prophylaxis and therapy of animal disease, including zoonoses, and with the morphology, physiology and reproduction of healthy animals and with problems of animal health in general.

Following the BSE crisis, The Scientific Committees were replaced by a Scientific Steering Committee (Commission Decision of 10 June 1997 (97/404/EC)) and Scientific Committees in the field of consumer health and food safety (Commission Decision of 23 July 1997 (97/579/EC)). Among the major changes in the objectives compared to the previous advisory system were the emphasis of the principles of excellence, independence and transparency and development of new risk assessment procedures.

The structures and principles laid down in 1997 were by and large retained when EFSA was established as an independent agency in 2003 (Regulation (EC) No 178/2002 of the European Parliament and of the Council of 28 January 2002 laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety).

Within the area of animal health the SPS agreement has been a major driver responsible for scientific advice moving in the direction of risk assessments. It sets out the basic rules for food safety and animal and plant health standards. It allows countries to set their own standards but also says that regulations must be based on science. Standards should be applied only to the extent necessary to protect human, animal or plant life or health. Measures to ensure food safety and animal health should be based as far as possible on the analysis of objective and accurate scientific data and assessment of the actual risks involved. Factors taken into consideration, the assessment procedures and the level of risk determined to be acceptable should be disclosed in a transparent manner.

Ever since its establishment EFSA's Animal Health and Welfare Panel has been committed to adapting its scientific opinions to include risk assessments whenever relevant. The need to develop a framework of methodologies and guidelines has repeatedly become apparent in the course of preparing scientific opinions. Whereas international guidelines for import risk assessments have been developed and brought into place by OIE, other areas of animal health and particularly animal welfare remain a continued field of development of risk assessment approaches.

Until now the Animal Health and Welfare Panel has developed a general guideline for including risk assessments in opinions and more specifically a guideline on the use of modelling in animal health assessments. The presentation will attempt to give an overview and status of risk assessment methodologies as applied by the Panel and indications for future development.

Risk assessment related to recognition of disease free status after outbreaks

By Sten Mortensen – DVM, PhD, Danish Veterinary and Food Administration

The reopening of trade in animals and food products after outbreaks of disease in a country or region requires surveillance activities to document disease free status. We need to work with the trade partners to restore their confidence. One of the factors in this will be the quality of a surveillance programme which should be tailored to address the particular situation, i.e. the epidemiology of the disease, the structure of the population, the disease eradication programme and the methods used for surveillance.

The international animal health organisation OIE have developed a general surveillance guideline as a part of the Terrestrial Animal Health Code (chapter 1.4) and specific surveillance method provisions in each of the disease chapters.

Some Danish examples of risk assessment related to disease outbreaks will be presented, i.e. the regionalization procedure during the Newcastle disease outbreak in 2002 involving outbreaks in 135 poultry flocks and the surveillance in zones created during the 2006 avian influenza H5N1 outbreaks in wild birds.

A rapid qualitative risk assessment for use in Veterinary Administration: the DEFRA approach

By Dr Helen Roberts – International Disease Monitoring and Risk Assessment, Global Animal Health, Defra, London

The UK Department of the Environment, Food and Rural Affairs (Defra) is committed to increasing the resilience and competitiveness of the UK food chain. In order to uphold this commitment, a team of policy advisors, scientists and vets work together to provide a risk-based approach to animal health and welfare. Through a series of inter-related programmes we aim to detect and risk assess new and emerging diseases; prevent, control and eradicate certain diseases; protect public health and; support and encourage a strong and productive industry.

The International Disease Monitoring (IDM) team in Global Animal Health at Defra was first set up in the wake of the 2001 Foot and Mouth Disease outbreaks in the UK, with an aim to horizon scan for new threats and vulnerabilities to the UK livestock population. The IDM team uses official disease reports from around the world to monitor disease risk and trends in new and emerging diseases. These reports come from the World Organisation for Animal Health (OIE), European Commission, Foreign and Commonwealth Office, scientific articles and personal contact with reference laboratories. More broadly speaking, monitoring in this way underpins safe trade in live animals and products of animal origin (POAO), avoids technical barriers to trade, promotes productivity in farmed animals, avoids food borne illness and avoids zoonotic infections i.e. human diseases which are acquired from a vertebrate animal.

The IDM team monitors high impact diseases for new outbreaks in trading partner countries, changing disease trends and emerging diseases, and assigns a risk level to the situation. This monitoring is reported on as regular monthly, quarterly and *ad hoc* reports to Defra's disease surveillance and preparedness teams, as well as the Animal Health agency, policy makers and a wider government audience, including Cabinet Office and UK Border Agency.

This presentation will focus on three areas of our work:

1. We have developed a simple Excel spreadsheet tool to give a semi-quantitative measure of the risk of disease introduction. The tool uses a decision matrix based on the hypothesis that a disease would be introduced into the UK through trade (legal and illegal) of live animals or animal products or through movement of vectors or wildlife. The tool depends upon being able to answer several questions:
 - is the disease present in the country of interest?
 - what pathways are important in disease transmission?
 - are those pathways important in terms of trade of live animals and animal products or in terms of (wild) animal/vector movements?

- does the UK trade with the particular country and in those particular commodities which are considered a risk?
- are there any mitigation measures in place in the country where the disease is present, which would reduce the risk?

Using these questions, a risk level can be assigned and regularly updated according to changes in disease prevalence or intensity, or trade fluctuations.

Identifying policy business needs

2. Disease control strategies are a vital part of a resilient control programme. However, particularly in the current financial climate, resources are limited and prioritisation of business needs is paramount. A simple framework can be developed, and using expert opinion, used to determine the relative priorities of where business needs lie, against animal health risk to give a combined score which will inform where to best target resource:

- disease prioritisation is based on several factors: impact on animal health; impact on public health; impact on international trade; impact on society; impact on Defra reputation;
- business needs are prioritised according to whether there is already a policy in place; whether there is a legislative basis for disease control; is the legislation functional; are any licences in place; are there any contingency plans or field instructions.

Case studies

3. Recently risk assessments have been carried out for Equine Infectious Anaemia, West Nile virus and Highly Pathogenic Avian Influenza. An example of prioritising business needs will be given, using African Horse Sickness and Foot and Mouth Disease. These will be discussed in more detail during the talk.

The workshop on the following day will give participants an opportunity to familiarise themselves with the tools and concepts.

Is Bluetongue control worthwhile? – An economic analysis of Bluetongue control in Sweden

By Diana Viske, Bo Norell, Jan Johansson, Lars Pettersson, Lars M Widell – Swedish Board of Agriculture, SE-551 82 Jönköping, Sweden

An economic analysis of Bluetongue (BTV8) control in Sweden was made during 2009–2010 by the Swedish Board of Agriculture. The analysis is intended as a guide for decision-making regarding Bluetongue control, primarily as regards the profitability of future vaccination campaigns. The analysis shows the costs that the infection would cause if it were allowed to spread freely, both for livestock production and for the rest of the economy. The analysis also shows what resources can be devoted to vaccination. The study has analysed the total economic effects with no regard to distributional effects of various sources of financing.

Background

Starting in 2006, BTV8 has spread unexpectedly and drastically in Western Europe. In the autumn of 2008, Sweden detected antibodies against BTV8 in 27 bovine herds and in three sheep herds. Introduction is thought to have occurred by infected midges blown across the border. A vast vaccination campaign began in September 2008 with the aim of eradicating the disease in Sweden. The campaign is expected to last two years and cost some SEK 176 million (approx. EUR 18,5 million).

Costs if Bluetongue were allowed to spread freely in Sweden

In order to calculate the profitability of various vaccination strategies against Bluetongue, one needs to estimate the scope and cost of a hypothetical uncontrolled outbreak in Sweden. This cost can then be compared with the cost of various vaccination options.

This analysis uses data on morbidity and mortality from the Bluetongue outbreak in the Netherlands in 2006–2007.¹ Furthermore, a model for calculating disease costs for Bluetongue in infected herds in the Netherlands² during the same period forms the basis for parts of the calculations of estimated costs of an outbreak in Sweden, assuming the same morbidity and mortality on infected farms as in the Netherlands. The model has been slightly adjusted to Swedish conditions, and Swedish country-specific data on economy and demography have been used.

Potent vectors are believed to be present in all of Sweden, and it is possible for the disease to spread. However, there are no applicable epidemiological models for Bluetongue in Sweden. Therefore a simplified model is used to calculate costs over time in case the disease would be allowed to spread freely in Sweden. The economic analysis shows that the estimated cost to agriculture during a twenty-year period of free Bluetongue spread would amount to some SEK 800 million (EUR 84 million) in present value, or on average SEK 56 million (EUR 5,9 million) per year (using a discount rate of four per cent). The largest total losses in case of unhindered spread of the infection would arise in the dairy sector, and the largest losses in relation to income would arise

in the sheep sector. Using a Leontief Input-Output model, the knock-on effect for the rest of society has been estimated to be of the same magnitude. The study also applies a regionalised model for these effects in order to analyse the difference between various Swedish regions.

Mainly due to the effect of development of natural immunity, the results of the calculations using the cost model are stable for variations in the rate of disease spread. However, they are more sensitive to variations in morbidity and mean disease costs per animal on infected farms.

Compulsory vaccination

The method that has been shown to be by far the most efficient for limiting Bluetongue spread and reduce production losses is vaccination. The objective of a compulsory vaccination campaign in Sweden would primarily be to regain freedom from Bluetongue. By compulsory vaccination with a high coverage for two or three years, it is believed that the disease can be eradicated. The higher cost of compulsory vaccination, as compared to voluntary vaccination, is weighed against savings on disease costs, i.e. the value of being free of the disease in subsequent years. Freedom from disease has a high value, and investing in it is therefore economically sound even in fairly large areas and frequent reintroduction of the disease.

However, whether or not it pays to eradicate Bluetongue depends on the infection pressure from neighbouring countries. Similarly, if one were to take into account lower infection pressure on other Bluetongue-free neighbouring countries by eradicating the infection, profitability would increase even further. The protective effect for other countries might be a factor to be taken into account at international level.

Voluntary vaccination

If Bluetongue is introduced too often and into too large an area, voluntary vaccination is a better option. It would probably not be possible for Sweden to become free of Bluetongue in this way, since vaccination coverage would be too low. The costs of voluntary vaccination would therefore not be limited to two or three years, but would need to be repeated every year comprised by the analysis. This means that voluntary vaccination in general has a lower profitability than compulsory vaccination. There is no subsequent disease-free period, and both the disease risk and costs remain for all herd owners who choose not to vaccinate. For the individual herd owner, voluntary vaccination is generally profitable in dairy cattle herds, but of dubious profitability in herds of suckler cows or sheep. However, for animal welfare reasons all herd owners should be advised to vaccinate their animals.

Reference

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The approach to assessment of risk of disease introduction in the Danish Veterinary and Food Administration

By Sten Mortensen – DVM, PhD, Danish Veterinary and Food Administration

Outbreaks of contagious diseases in other countries may pose a risk to Danish farm animals because in principle, they are part of one European common market with free trade of live animals, animal products and food.

In each case, the risk is assessed by combining available information from the outbreak country with specific information about imports in the risk period (i.e. in the TRACES database) and other characteristic risk factors of the Danish industry. Examples of these factors will be given.

The Danish dairy industry is important with 1.6 million cattle in Denmark. Less than 1000 cattle are imported each year. Many Dutch farmers have bought farms in Denmark. Therefore special attention will be given to outbreaks in the Netherlands because of many links to the feed industry and Dutch farms.

The Danish pig industry is huge with more than 80% of pore being exported. Less than 1000 pigs are imported each year. More than 8 mio. pigs are being exported each year, mainly piglets but also pigs and sows for slaughter. Many animal (empty) transport trucks of multiple nationalities therefore arrive in Denmark each day.

The broiler industry is characterized by a high level of biosecurity. The layer industry is mainly producing for domestic consumption. Grand parent stock is imported.

The turkey fattening farms are satellites of the German industry with hatching and slaughtering in Germany.

The sheep and goat sector is mainly hobby production with less than 100 commercial farms.

The approach to risk assessment in the Veterinary Administration in Estonia

By Maarja Kristian

Summary

The Estonian Veterinary and Food Board is a governmental agency carrying out its tasks under the aegis of the Ministry of Agriculture. It functions as a supervising body and ensures that the requirements of legislation on animal health, food safety, market regulation, animal welfare and farm animal breeding, are followed. It supervises the implementation of these requirements and enforces them by legislative means. The central office co-ordinates the veterinary and food control activities and the county centres are responsible for implementation.

The fifteen County Veterinary Centres (CVCs) are responsible for the practical implementation of the various food and feed safety, animal health and welfare monitoring programmes and for supervision of the activities of Authorised Veterinarians (AVs) at farm and slaughterhouse level.

The Veterinary and Food Board has prepared instructions for the assessment of risk levels and for risk-based surveillance schemes in aquaculture businesses. These instructions are based on Directive 2006/88 stipulating that the Member States shall ensure that a risk-based animal health surveillance scheme is applied at all fish farms and in all mollusc-farming areas.

The instructions are designed for animal health specialists working in County Veterinary Centres to assess the risk level of authorised aquaculture businesses and for the purposes of surveillance.

A risk level shall be determined at the beginning of a year and a surveillance plan will be prepared based on determined risk levels.

Inspection frequency shall be determined taking account of the animal health status of a zone or compartment and the risks the aquaculture production farms or mollusc-farming areas pose in relation to the contracting and spreading of disease.

The zones and compartments fall within 5 animal health status categories. The instructions include principles and criteria for determining a risk level which can be high, medium or low.

When determining the risk level of an aquaculture production farm and mollusc-farming area different factors shall be taken into account such as direct spreading of disease through water, movements of aquaculture animals, type of production, the species of aquaculture animals reared, biosecurity system etc. The primary risk factors are direct spreading through water and movements of aquaculture animals.

The Veterinary and Food Board shall decide whether to conduct at farms a passive, active or targeted surveillance as well as the frequency of surveillance schemes based on the results of the risk analysis.

The Approach to Risk Assessment in the Veterinary Administration in Finland

By Taina Aaltonen – Director, Animal Health and Welfare, Finnish Food Safety Authority Evira

The risk assessment unit was established in the Veterinary and Food Research Institute in Finland in 2000. The purpose of the decision was to acknowledge the requirement of the SPS agreement and to acquire scientific and objective information to support the risk management and decision-making in the field of animal health and food safety. It was considered important to be able to better identify and analyse the hazards and their consequences in the Finnish circumstances and also have better knowledge on the effects and gaps of the present regulations and the interventions implemented.

In 2006, the Veterinary and Food Research Institute became a part of a new organisation: Evira, the Finnish Food Safety Authority. Evira is responsible for the whole food chain: ensuring the safety of food, promoting the health and welfare of animals and providing the required preconditions for plant and animal production as well as plant health. In Evira, the Risk Assessment Unit was first an independent unit outside the departments, but was in June 2010 integrated into the Research Department.

During the past 10 years, many projects have been undertaken focusing on different hazards and interventions. Risk assessment has been used to analyse import risk of certain commodities and diseases, to analyse surveillance programmes, to support contingency planning, to evaluate country status in relation to certain diseases and to acquire more information on the efficacy of different intervention measures. The focus has mainly been in exotic diseases in production animals and zoonoses, especially salmonella. However, other diseases and other species have also been assessed with a view to be able to control them more efficiently.

The projects can be categorised as qualitative and quantitative risk assessments, risk profiles and other special projects launched to give more information on a special question. Many of the projects have been ordered by the Ministry of Agriculture and Forestry, others by the Industry or Evira, often relating indirectly to requirements in the EU legislation. The projects have to a large extent been financed directly from the Evira budget, but some have received support also from different funds. Data for the projects is obtained from relevant statistics, published studies, special surveys or from expert opinions. The guidelines of the OIE have been followed in the projects.

Import risk has been assessed in relation to echinococcosis, classical swine fever, paratuberculosis, BSE (live cattle and meat-and-bone meal), BVD (special focus on bovine semen from USA), bluetongue and salmonella. To support contingency planning, quantitative modelling or other assessment on exposure and/or disease spreading and the impact of different interventions has been carried out for CSF, FMD, Newcastle disease and other exotic poultry viruses and bluetongue. A preliminary assessment on the animal health surveillance programmes with the intention to continue the assessment later on, has also been undertaken.

The risk assessment of the salmonella control programme (pork, broilers, egg layers) has been one of the main focuses together with the easily spreading diseases.

Salmonella RA has been especially important to be able to assess the benefits of the programme to human health compared to the costs caused, to scientifically justify within EU the need to continue the additional guarantees and to guarantee the correct focusing and frequency of the sampling and the interventions implemented. Also the measures applied in fish farms against VHS as well as those available for paratuberculosis have been assessed. Some projects on animal by-products have also been finalised. One to assess the hazards of animal diseases from raw former foodstuffs of animal origin from the retail trade and another, to assess the use of raw milk containing residues as feed for pigs and calves. Both were launched to support the participation in the legislative process within EU.

Some projects have contained the evaluation of the economical consequences (eg. salmonella, CSF, FMD) and in these cases co-operation has been carried out with MTT Agrifood Research Finland.

Most projects have very clearly supported the legislative process, contingency planning and other decision-making. Insufficient data may have affected the conclusions and usefulness of the results of some projects.

A continuous dilemma is how to be able to predict and communicate early enough the hazards and interventions for which risk assessment is needed. Especially, the quantitative risk assessment requires sufficient time. However, it would be important to arrange resources for both the more time-consuming profound quantitative risk assessments as well as for the rapid projects needed by the risk management in urgent cases. A proactive approach should be pursued also here. A clear procedure and planning of the project is a prerequisite for success and the transparency and the independency of the risk assessment has to be guaranteed self-evidently. Good quality risk assessment based on sufficient data and right-timing is a useful tool for the rationale and justified risk management and decision-making.

Risk assessment as a tool in veterinary contingency planning

By Lis Alban – Chief scientist, DVM, Ph.D., DiplECVPH, DiplECPHM, Danish Agricultural & Food Council, E-mail: lia@lf.dk

Summary

Any system should be evaluated from time to another to ensure that actions in place work effectively. This is relevant for biosecurity as well as for many other issues. Because if the risk changes, e.g. with respect which commodities it is associated with, prior belief is no longer valid. Moreover, if risk management is not based on updated risk assessments, risk-mitigating actions taken might be wasted. And in the worst case, the feared scenario occurs, because risk management was inadequate. It might also be a question of resources spent wrongly; either more resources than necessary (a waste of money) or too few (too dangerous). Both situations should be avoided. And here, risk assessment is an effective tool to provide an overview of how to design contingency planning. Examples of projects conducted and risk-mitigating actions in place are presented that illustrates the usefulness of risk assessment

International guidelines used

International guidelines for risk assessments should be used. First, risk pathways are identified. Here it is explored what might go wrong. Next, probabilities are allocated: How often does this happen? This can be done either qualitatively or quantitatively. If a qualitative approach is used, then it is assessed whether the probability is negligible, low, medium or high – and it is defined what is meant by each of this classifications. Contrary, mathematical expressions, modelling or simulations are part of a quantitative approach.

Introduction or spread?

It is necessary to distinguish between probability of introduction of an exotic contagious disease and spreading once introduced (Table 14). Introduction implies introduction into a country as a whole, because the disease-free status is lost, in the moment a single infected herd is diagnosed. Spreading implies spreading of disease after introduction. Such a distinction is in particular of relevance for risk mitigation, because some actions reduce the risk of introduction, whereas other slow down – or even prevents – the spreading, should an unwanted hazard enter the country.

Endemic or exotic?

In line, a distinction should be made between *endemic* diseases or *exotic* diseases (Table 13). Endemic diseases are diseases that are already present in the country. That can e.g. consist of SPF-diseases like pleuro-pneumonia caused by *Actinobacillus pleuropneumonia*. Contrary, exotic diseases are diseases which are not present in the country. For Denmark that includes foot and mouth disease or classical swine fever. In some cases, a disease can be considered as endemic in one country and exotic in a neighbouring country. This is the case for porcine reproductive and respiratory

syndrome (PRRS); this is widespread in Denmark and absent in Sweden despite of a substantial trade in pork.

Collaboration required

Usually, risk assessments related to contingency planning are complicated. The work is therefore often conducted in collaboration between different institutions like university, veterinary services, and experts from abroad as well as the industry.

Table 13: Overview of evaluation of risk of animal disease in livestock as well as examples of actions in place to reduce risk or projects conducted that have evaluated the risk

Risk for	Endemic/ SPF diseases	Exotic diseases
Introduction	Washing and quarantine of livestock trucks as well as quarantine for persons working with livestock Certification of breeding herds with respect to disease freedom Contract between supplier and receiver herd	Control of washing, disinfection and 48-hours quarantine for livestock trucks used for export Wild boar in Denmark?
Spreading	Sectioning/Vaccination – All-in-all-out	7/30 days rule for trade in breeding animals Early warning, Wild boar in Denmark?

Compartmentalisation – a new concept

The concept of compartmentalisation is used increasingly to distinguish between types of herds, where animals from one compartment are subjected to one kind of surveillance, whereas animals from another compartment are subjected to a different kind of surveillance. This approach is the backbone of risk-based surveillance for *Thchinella* in pigs.

Emerging issues

Currently it is being discussed whether control of cleaning, as well as disinfection and 48-quarantine should continue to be conducted for livestock trucks after arrival to Denmark. This has a documented risk-mitigating effect on introduction of classical swine fever. In line, development of early warning systems is in the pipeline (Table 14). Here, data from the rendering plants might be used to identify herds with a sudden increase in mortality. Vector-borne diseases like bluetongue and African swine fever are also of interest. The disease pattern has altered because of climate changes and export/trade is on the increase.

EU Animal Health Strategy

The new Animal Health Strategy for the European Union states that effective on-farm bio-security measures will constitute an important criterion of zoning and compartmentalisation procedures for disease control. Additionally, means of rating farms and supporting development of responsibility and cost-sharing such as disease-free status, animal welfare measures and veterinary surveillance and control are on the agenda (<http://ec.europa.eu/food/animal/diseases/strategy/index.en.htm>).

Index systems for biosecurity

A project is in the pipeline in Denmark that deals with the development of an index system for biosecurity in livestock farms and studies their use as incentives for farmers to improve on-farm bio-security. The basic idea of the project is to study the mechanisms of market-mediated biosecurity index-based assurance schemes, which optimize private and public incentives for cost-sharing of disease management in agriculture. The output of such a system might be used in contingency planning in the future.

Cost-effectiveness aimed for

As it is noted, risk assessment can be used to identify *if* there is an unacceptable risk, and if the answer is yes, *where the* risk is and *what* is causing it. Finally, the effect of different risk-mitigating action should be explored, and cost-effectiveness is an important issue for this part.

The approach to risk assessment in the Veterinary Administration in Iceland

By Audur Lilja Arnthorsdottir – Veterinary Officer for Epidemiology, The Icelandic Food and Veterinary Authority

The main governmental bodies in Iceland, involved in risk analysis regarding animal health, are the Icelandic Food and Veterinary Authority and the Institute of Experimental Pathology at Keldur. These institutions are organizationally independent of each other, the former is responsible to the Ministry of Fisheries and Agriculture and the latter to the Ministry of Education. In addition, a veterinary council, appointed by the Minister of Agriculture, in line with provisions of the Act on Veterinarians and animal health services, conducts risk assessments regarding import of livestock. Recently the government of Iceland has established an agreement with the EU as regards an entitlement to participate in the European Food Safety Authority activities and has accordingly the possibility to seek advice and request risk assessments from EFSA's Animal Health and Welfare Panel, through the EU Commission.

The main areas for risk assessments within the animal health sector in Iceland, are import of live animals, animal products and fomites; movement of animals and fomites between control zones within the country; measures following detection of infectious diseases; organization of surveillance regarding animal health; and emergency preparedness planning.

Import

Every time an application for import of live animals, animal products etc. is received, risk assessment is made by specialists of the Food and Veterinary Authority, making use of a specific protocol. The basis for the assessment is the current animal health status in Iceland and in the exporting country, the nature and quantity of the import etc. Expert groups are asked for opinion when more elaborate assessments is needed, especially concerning import of live animals.

Movement of cattle and sheep within the country

Movement of live sheep is only allowed from specified zones within the country and only upon assessment of each case by the Food and Veterinary Authority.

Live cattle may only be transported from one control zone to another subsequent to assessment of their health compared with animal health in the destination zone, especially as regards paratuberculosis. The risk associated with the movement is assessed each time an application is received. A more thorough risk analysis was conducted in 2008 where the likelihood of spread of paratuberculosis with movement of cattle was assessed by an expert group appointed by the Ministry of Agriculture.

Response to infectious diseases

Following an infectious disease outbreak, an assessment is made of the likelihood that the infection will spread and which transmission routes are most likely. Infectivity of carcasses and various forms of waste is assessed, before decisions are made regarding disposal. In most cases the time for this kind of assessment is quite limited.

The main endemic infectious diseases in Iceland are scrapie and paratuberculosis in sheep. Other infections of concern, especially due to their zoonotic nature, are salmonellosis in poultry and swine, and campylobacter in broilers.

Surveillance

Risk assessments are made each year, regarding surveillance of animal diseases and animal welfare. The need for farm-inspections is assessed and a plan for analyses of samples is revised. The assessment is made on the basis of results of previous year's surveillance but is restricted by legislation, international agreements and economic constraints.

Contingency plans

The Food and Veterinary Authority is responsible for emergency preparedness planning and maintenance of contingency plans. A generic contingency plan regarding exotic animal diseases was put together many years ago and has since gradually been improved. Sections with issues specific for certain diseases have been added to the plan little by little. The main driving force for improvement of the plan is the risk of introduction of new diseases at each point in time. Hence, in recent years it has been BSE, Foot and Mouth Disease, Avian Influenza and the pandemic H1N1 2009 influenza. Bluetongue is not a threat for the time being in Iceland, as the vector, *Culicoides*, does not exist in the country. Contingency plans regarding other hazards have also been developed, e.g. volcanic eruptions, critically spoiled feed and food borne illnesses.

The approach to risk assessment in Food and Veterinary Service of Latvia

By Edvins Olsevskis – Deputy Director of the Veterinary Surveillance Department, Food and Veterinary Service, Latvia

Food and Veterinary Service (FVS) is competent authority in Latvia responsible mainly for surveillance of animal health, animal welfare and food safety issues. FVS performs control in a whole food chain – “from stable to table”.

There was specific unit in Veterinary department for risk analysis – Risk analysis division, but it was removed from the structure of the FVS in a process of reorganization (optimization) in 2007. It was decided that risk assessment, risk management and risk communication will be under responsibility of each professional structural division of FVS, however scientifically based quantitative and qualitative risk assessments will be requested from national and international scientific organizations.

Animal infectious diseases surveillance division (AIDSD) is an important component of the FVS ensuring risk based contingency planning, infectious disease surveillance and control in Latvia. AIDSD carries out risk assessment on a regulatory basis for different areas including substantiation of the prophylactic measures to be implemented, elaboration of the risk based disease surveillance, monitoring and control programmes following the analysis of disease situation in a neighbouring and contact countries, evaluation of alternative control strategies, preparation and update of the contingency plans for epizootic diseases.

The main information sources for daily risk assessment in Latvia are:

- information from the national data bases;
- results of the animal infectious diseases surveillance and monitoring programs;
- information received from CVOs of the neighbouring countries and European Commission (EC);
- ADNS (EC) and WAHIS (OIE) system notifications.

There are several risk assessments requested from national and international scientific institutions:

- biology of migratory waterfowl species in Latvia in a context of the risk for introduction of avian influenza in a territory of Latvia (done by Biologics institute (Latvian University) in 2006);
- prognosis for different insects (black fly, midges) activity (done yearly by Entomology Department of Biologics institute (Latvian University));
- distribution, quantitative parameters and biological individuality of Culicoides species as vectors of Bluetongue in Latvia (done by Scientific Institute National Diagnostic centre of Food and Veterinary Service);

- *Trichinella* officially free pig holding status granting possibilities in Latvia taking into account Trichinelosis situation in Latvia both in domestic and wild pig population (done by Faculty of Veterinary Medicine (Latvia University of Agriculture) in 2010).

EFSA local contact point is also involved if there is need for risk assessment that is not possible to carry out in Latvia.

There is planned to establish new institution "Agency for risk assessment and product registration" under the FVS which will start to operate after 1 January 2011. The new agency will also be responsible for animal health and food safety risk assessments.

Risk Based Animal Health Surveillance and Contingency planning in Lithuania

By Egidijus Pumpudis – Food and Veterinary Service of Lithuania

Animal disease emergency can have serious socio-economic consequences which, in extreme cases, may affect the whole national economy. If a new disease is recognized quickly while it is still localized and prompt action is taken to contain and then to progressively eliminate it, the chances of eradication of the disease are enhanced. Conversely, eradication may be extremely difficult, costly and even impossible if the disease is not recognized on time and no appropriate control action is taken against it before it becomes widespread or established in wildlife.

Some fundamental components of animal disease emergency preparedness are the development of capabilities for early warning and early reaction to disease epidemics. These require advance preparation of both generic and disease-specific written contingency plans and standard operating procedures, as well as testing of such plans, training of staff; the development of capabilities at national and local veterinary headquarters, including field and laboratory services; development of mechanisms to involve other necessary government and private sector services and farming communities in the emergency response; development of the capacity to apply all the necessary resources to counter the disease in the most efficient way (including equipment, products such as disinfectants, personnel and finances); and, finally, advance establishment of the appropriate legal and administrative structures to deal with an emergency.

In Lithuania, consumer interests in the areas of food safety, animal health control and veterinary surveillance are ensured by the National Food and Veterinary Risk Assessment Institute (NFVRAI), which effectively implements state policy by providing scientific information, scientific and technical support and communication of risks in the areas of food safety and veterinary control.

The NFVRAI was established in order to separate risk assessment from risk management and thus to strengthen protection of the consumer interests and to implement the European Community requirements in the fields of food safety and veterinary. Risk assessment is neither influenced by any political or economical and social interests. By carrying out risk assessment based on the research and scientific knowledge, the NFVRAI identifies risks and contributes to the reduction of risks in food and feed safety, animal health and animal welfare, and the environment. The autonomy of the NFVRAI is based on the scientific integrity of its assessment and findings.

The Centre (department) for Contingencies and Contagious Diseases was established in the State Food and Veterinary Service of the Republic of Lithuania (SFVS). This department is responsible for the analysis of the situation of highly contagious diseases, assessment of risk factors and adoption of decisions on contingency measures in respect of highly contagious animal diseases, as well as the coordination of the SFVS subordinate institutions in their preparedness to combat contagious animal diseases, arrangement and implementation of control measures of highly contagious diseases and update of contingency plans for highly contagious animal diseases.

A mathematical model for optimising prophylactic treatment strategies of companion pets moving from Echinococcus multilocularis endemic areas to countries free of infection

By Rene Bødker – Danish National Veterinary Institute, Technical University of Denmark

Echinococcus multilocularis (*Em*) is a minute tapeworm residing in the small intestine of carnivores like foxes and dogs. The eggs produced form cysts in the intermediate mice hosts and develop into the adult worms when ingested by a suitable carnivore. However, cysts may also develop in accidental intermediate hosts such as humans. The disease, human alveolar echinococcosis, is fatal in untreated patients and results in reduced survival rates in continuously treated patients. Finland, Ireland, Malta, Sweden, UK and mainland Norway consider themselves free from *Em*. These countries therefore require dogs, cats and ferrets to be treated with an appropriate drug to prevent accidental introductions. Ireland, UK and Malta requires dogs to be treated 24–48 hours before entry, while Sweden and Finland allow treatment up to 10 and 30 days respectively prior to entry. Such national legislations are however under pressure from the EU Commission who wants to abandon national rules to insure free movement of goods between the member states. There is thus a need to objectively assess the risk of introducing *Em* to free areas in order to optimise preventive strategies while insuring national legislations does not cause unnecessary or irrational trade barriers.

A qualitative import risk assessment model has been presented by EFSA. The EFSA model estimates the annual risk of importing infected dogs from an endemic area to a specific free country when taking into account the number of dogs imported, the risk of infection in the countries of origin, treatment efficacy and reinfection risk after treatment. The EFSA model identified relatively high risk of reinfection in the Swedish and Finnish prophylactic treatment strategies. These strategies allow Praziquantel to be administered 10 and 30 days prior to entering Sweden and Finland respectively. Because the drug is only effective 24 hours after oral intake, these strategies leave 9 and 29 days for the dogs to be reinfected in endemic areas. The lifespan of the worms is only 90 days and the maximum prevalence is therefore reached after 90 days exposure. A reinfection period of e.g. 9 days will thus allow for 10% of the maximum prevalence to be reached in the period between treatment and crossing the border. In the worst case the Swedish and the Finnish strategies only reduce the probability of importing an infected dog with 90% and 68% respectively. EFSA therefore recommended that pet animals are treated with a single dose of Praziquantel 24 to 48 hours prior to departure.

The EFSA risk assessment model defines risk as the probability of introducing a dog with an *Em* infection. However, I suggest *Em* may not be so contagious that a single infected animal crossing the border necessarily will result in the successful establishment of the parasite. A worm will produce a large number of eggs in its lifetime. But on average only very few of these eggs will result in a new adult tapeworm. And because the real concern is establishing the parasite in a free area rather than the risk of importing an infected dog, I propose risk should be defined as the number of

eggs excreted in a non-endemic area. Furthermore I suggest that the probability of establishing the parasite in a free area is linearly proportional to the number of eggs excreted in this area, and that this is a better measure of risk than the number of infected dogs crossing the border. An import risk assessment model do not differentiate between dogs with many or few worms, between long or short stays in the free area, whether the worms are egg producing or still in the immature stage or whether the worm are young or old and thus likely to have a long or short remaining lifespan. I here present an alternative deterministic mathematical model which calculates the average number of eggs excreted in a free country by a dog exposed in an endemic area. The model quantifies the risk as the cumulative number of eggs excreted by a dog in the free country. In order to calculate the number of eggs excreted, the model calculates the probability that a dog is infected in the endemic area of exposure, and also the number of worms the dog is carrying as well as the duration each of these worms remaining lifespan together with the number of days the dog will spend in the non-endemic country. The model also takes into account that the worms undergo a 30 days immature stage before developing into a mature egg producing stage. The model allows for a comparison of the relative risk in individual dogs with different durations of exposure in endemic areas and various durations of visits to a free country, ranging from a few hours to permanent import. These import scenarios are then combined with various treatment strategies e.g. treatment 10 or 30 days prior to import, and even treatment several days after entering the non-endemic area.

The model calculated that the number of eggs deposited in a free country was reduced the closer the treatment took place to the time of entering the free country. But the model calculated the risk resulting from reinfection under the Swedish and Finnish treatment strategies to be relatively higher than did the EFSA model. This is because the worms potentially reinfecting the dogs after prophylactic treatment were all young and thus were expected to have a relatively long egg producing lifespan in the free country compared to the worms acquired before treatment. While both the EFSA model and this model calculated a 90% reduction in the risk of infections in dogs when treating the dogs 10 days prior to import, this model calculated that the actual number of eggs deposited in Sweden was only reduced by 85% because the reinfecting worms produced more eggs.

Somewhat counter intuitively and contrary to the EFSA risk assessment model, this model predicted that delaying treatment until arriving in free country may sometimes be highly advantageous. Delaying treatment of Swedish dogs returning from a visit in an endemic area resulted in fewer eggs being deposited in Sweden. The shorter the duration of the stay in an endemic area the greater was the relative advantage of delaying the treatment. The benefit was very high when the stay in the endemic area was less than 30 days. This was because returning dogs only carried the immature worm stage and therefore could not excrete eggs after returning to Sweden as long as the dogs were treated in Sweden before the worms matured to the egg excreting stage.

The model suggested that e.g. a dog permanently imported from Central Europe and treated 10 days prior to entering Sweden using a 99.6% efficient drug on average would deposit 400 million times as many eggs and hence constitute a 400 million times

higher risk than a treated Danish dog passing Sweden in four hours transit. This is a much higher difference than would be estimated by a traditional import risk assessment model. This is because import risk assessment focus on the difference in infection incidence in the two endemic areas of exposure, but ignores that infected dogs from high risk areas also have higher worm burdens and ignores that dogs in transit have much shorter time in the free country to deposit eggs than dogs permanently imported, and finally ignores that reinfecting worms remains in the immature stage during transit while they will eventually mature and excrete eggs in permanently imported dogs. The only eggs that dogs in transit may deposit will therefore originate from the few worms surviving treatment due to treatment failure.

Because we do not know the actual risk of establishing the infection caused by each deposited egg the model cannot quantify the risk. But the model allows for relative quantitative comparisons of different import scenarios, endemicity levels, drug efficiencies and treatment strategies, and can thus be useful for optimising national preventive measures in an objective and transparent way.

A web-based, near real-time disease surveillance system for demonstrating space and time-space clustering of events

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Background

Prerequisite to understanding changing local, regional, or global distributions of disease or disease risks is the rapid access to current surveillance data that can provide the necessary situational awareness of disease and of factors potentially associated with disease risk.

"The Disease BioPortal" is an unrestricted, public web site (<http://fmdbioportal.ucdavis.edu>) created by CADMS and has been in operation since January 2007. The Disease BioPortal operates with support from a consortium of organizations that engages funding from the National Center for Medical Intelligence, the University of California, the USDA Animal Research Service, and the FAO, for purposes of making global disease data and information available in real time or near real time for display and analysis.

Updated and new databases: Whereas version 2.0 of the FMD BioPortal was almost exclusive for foot-and-mouth disease (FMD),¹ the new version 3.0 of the Disease BioPortal has an expanded repertoire of more than 40 diseases and accompanying databases, including the addition of new databases to the FMD section. Users automatically receive information about global FMD events through the FMD News.

Operation and scope: In collaboration with many agencies, organizations, and institutes, the Disease BioPortal obtains in near real-time disease information from multiple data streams from public data sources world-wide. The design permits merging of data in disparate and non-standardized formats.

Visualization and analytical tools: Tools available in the Disease BioPortal allow for searches, assimilation, spatio-temporal viewing, mapping, and analysis of the data, including creation of selected phylogenetic trees for specified agents and on-line SaTScan spatio-temporal cluster analysis. Data can be presented in graphic and tabular form and visualized using a spatio-temporal visualization program that maps the progression of cases over time and geographic location. Case location also can be displayed using Google Earth.

Routing and secure data analysis: In addition to viewing of public data, the Disease BioPortal allows for secure routing and sharing of confidential data and the comparative analysis of personal or private data.

Application examples

Foot and Mouth Disease (FMD): Foot-and-mouth disease (FMD) probably has the greatest economic impact of any disease on global livestock production.

Argentina: A total of 2,126 herds, an attack rate of 0–82%, were affected during an epidemic of foot-and-mouth disease in Argentina in 2001. The spatial and temporal distribution of the epidemic was investigated using nearest-neighbour and spatial scan tests and by estimating the frequency distributions of the times to intervention, and distances and times between outbreaks. The outbreaks were clustered and associated significantly ($P < 0.01$) with herd density; 94 per cent were located in the Pampeana region, where the cattle population is concentrated, which had an attack rate of 1–4%. The clustering results suggested that the virus had spread locally between outbreaks. Most of the outbreaks were separated by one day and the maximum distance between outbreaks was almost 2000 km, indicating that the infection spread rapidly over large distances. The index outbreak was detected more than 15 days after the primary outbreak, and restrictions on the movement of cattle were probably not enforced until about one month after infection occurred. As in other major epidemics, the period between the first outbreaks and the effective application of control strategies was probably crucial in determining the progress of the epidemic.²

Japan: The 2010 outbreak data reported to the OIE (until 17 June) are available on the Disease Bioportal.

Avian Influenza (AI)

A prototype of an AIBioPortal was developed using the official wild bird surveillance data collected in Denmark in 2006, which include 45 identified cases of HPAI H5N1 infection among around 1,200 dead wild birds collected and tested (passive surveillance). In total 22 HPAI H5N1 viruses were isolated, of which 8 have been sequenced, while 23 cases were diagnosed by RT-PCR. All records have been uploaded on the most recent version of the Disease BioPortal system to create a prototype for an AIBioPortal at a national scale. Spatial-temporal analyses have detected clusters of higher incidence identifying the likely introduction and initial spread of the infection among various species of migrating wild birds.³ Recently, addition of the Swedish wild bird surveillance data was achieved, enabling joint analysis.

The general public may access this prototype at <http://fmdbioportal.ucdavis.edu>, logging in with the username “Denmark” and the password “avianflu”. The addition to the AIBioPortal of new users and additional data files are encouraged.

Other diseases

Data from the OIE on many of their listed diseases are captured and presented in the Disease Bioportal. An initial menu lists the diagnoses that can be found, and the search and subsequent analysis can be further refined to one or more geographical regions/countries selected from a second initial menu.

Vesicular stomatitis (VS): From 2004 through 2006, 751 vesicular stomatitis (VS) outbreaks caused by vesicular stomatitis virus serotype New Jersey (VSNJV) were reported in nine states of the southwestern United States. The normal model of the

spatial scan statistic and phylogenetic techniques were used to assess whether the spatial and genetic relations among VSNJV outbreaks were consistent with the hypothesis that VSNJV over-wintered in specific regions of the southwestern United States infected in 2004 and 2005, respectively.

Results were supported by the phylogenetic analysis of 49 VSV samples collected from 2004 through 2006 in the United States and 10 VSV samples originated from Mexico. These findings were displayed using the FMD BioPortal, were consistent with over-wintering of specific sub-lineages of VSNJV in a limited geographical region of the United States affected by a VS epidemic in 2005 and 2006.⁴

Rift Valley Fever: In addition to data taken from the OIE on reported animal disease occurrence, data from the WHO on human cases are available in the Disease BioPortal and the two files can be visualized and analyzed jointly.

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The approach to risk assessment in the Veterinary Administration in Norway

By Helga R. Høgåsen and Edgar Brun – National Veterinary Institute, Norway

The Norwegian Food Safety Authority (NFSA, Mattilsynet) is a governmental body responsible for the safety of food and water, for plant and animal health, and for animal welfare (animals including fish). Risk assessments are extensively being used by the NFSA to substantiate legislation and regulatory measures and directives, to define and rank hazards threatening the various food industries, for design and implementation of risk-based surveillance and control programmes, and to support recommendations to the public. The risk question is discussed between NFSA and the assessors to optimize the precision in the analyses and the interpretation of the results.

The main providers of risk assessments to the NFSA are institutions that are governmentally owned, but independent from the NFSA. The Norwegian Scientific Committee for Food Safety (VKM) was established in 2004 on the EFSA model to provide independent risk assessments of complex questions within a time frame of several months. The National Veterinary Institute (NVI) and the National Institute of Nutrition and Seafood Research (NIFES) provide risk assessments within a short to long time frame. Researchers from these institutions, particularly the NVI, are also heavily represented in the committees of the VKM. Both qualitative and quantitative risk assessments are provided.

Concerning animal health surveillance and contingency planning, specific risk assessments have been undertaken for rabies, bluetongue, bovine spongiform encephalopathy (BSE), brucellosis, avian flu, viral hemorrhagic septicemia (VHS) and *Gyrodactylus salaris*. In addition, risk ranking within fish diseases have been assessed, and risk ranking within sheep diseases is presently being assessed.

The main strengths are:

- the close collaboration between the NFSA and the risk assessors;
- the VKM secretary coordinates practical aspects of the risk assessment process;
- the NVI has a pool of multidisciplinary scientific competence to include in a RA-process.

The availability of animal and human data in central databasesThe main challenges encountered are:

- *the capacity*: Few people are trained in and dedicated to lead a risk assessment process. There is also a low buffering capacity for acute demands in all fields of interest. Competent people are usually fully occupied by routine work and funded research projects;
- *the time frame*: Rapidity and quality are difficult to combine, particularly with low capacity, and this may be hard to communicate to collaborators and public;

- *the availability of data*: Food safety control measures are more and more under the responsibility of the industry. This gives room for individual ways of collecting and storing data which may complicate the availability of the data for use in RAs. Communicating the uncertainty in biological data.

The approach to risk assessment in the Veterinary Administrations in Sweden

By Ann Lindberg, Jenny Frössling, Susanna Stenberg Lewerin, Helene Wahlström – Dept. of Disease Control and Epidemiology, National Veterinary Institute, Uppsala, Sweden

In Sweden, the responsibility for carrying out risk assessments (RA), on most veterinary issues, lies upon the National Veterinary Institute (SVA), whereas risks related to food of animal origin are assessed by the National Food Administration (SLV). Risk questions often arise within the Board of Agriculture (SJV) or within the industry, but may also come from within SVA or SLV. It should be noted that when zoonoses are considered, any risk assessment also involves the corresponding authorities on the human side.

The risk assessment activities at SVA are of different character; ranging from expert statements, via risk profiles to more formal risk assessments. Risk assessment can be perceived both as a process and as a time limited activity. The process has its specific need of maintenance and improvement regarding resources, competence and methodologies. For the time limited activities i.e. the individual risk assessment projects, a standardized approach has been developed. The objective is to produce risk assessments that are transparent, useful and of high quality by ensuring that i) the question to be answered is well defined and relevant, ii) that relevant competences are represented in the project group, iii) that the assessment is carried out in line with existing guidelines (OIE); iv) that both the client and stakeholders are involved in the process, and v) that the scientific quality of the output meets high standards. To ensure that the latter is achieved, the report is open to review on the SVA website and also, whenever possible, published in international peer reviewed journals.

Over the past decade, methodologies for animal health surveillance activities have developed in parallel with the realization that surveillance efficiency can be improved by introducing risk as a concept in the design. Also, methods have been developed where complex surveillance information (e.g. passive surveillance, non-representative surveys, routine post-mortem examinations) can be integrated in overall estimates of the likelihood of freedom from specific diseases/infections. In Sweden, disease freedom models have been developed for bovine tuberculosis in farmed deer (1), PRRS (2) and for paratuberculosis in cattle (manuscript in preparation). These diseases have all been targeted for eradication, and there has been a need for quantification of the likelihood that the goal has been achieved, for ourselves and for a wider international audience. A similar study on *Echinococcus multilocularis* is underway (in collaboration with Norway and Finland), to provide a transparent and quantitative argument to discussions regarding the current regulations regarding deworming for dogs entering these countries.

Furthermore, in a constantly changing world and with limited monetary resources there is a need to ensure that decisions on what (non-statutory) diseases to monitor are well founded. Therefore the SVA is setting up a transparent framework for prioritization of its surveillance activities, currently with focus on serological screenings. With this model, prioritization is based on factors related to international importance, to the epidemiology of the disease, whether the disease has zoonotic potential as well as

financial and environmental consequences. A differentiation in severity/importance is given by scoring each disease on thirteen factors within these areas, with a score ranging from 0 (absent/mild) to 4 (high/fatal/no treatment). In parallel, a reference group with representatives from stakeholders as well as other expert authorities/organisations has been proposed, in order to grant transparency and to capture a wider range of opinions in this process.

SVA is involved in the design of most animal health surveillance in Sweden. To ensure that the design is transparent and that sampling solutions are not merely practical but also scientifically defensible, a standardized protocol for designing/re-designing surveillance activities has been developed (3). To date, it has been applied to surveillance of IBR, BVD, EBL, PRRS, CSF and ASF. The protocol covers a) a clear definition of the ambition with the surveillance (particularly important for non-statutory diseases, like PRRS, where there is no international standard) in terms of design prevalences, both within-herd and at the herd level; b) a description of the target population; c) a risk profile of the target population in relation to the disease (animal- as well as herd factors that are associated with higher/lower risk for contracting the disease); d) expected sensitivities at individual and herd level (as applicable) and calculation of sample size for different combination of # sampled herds and # sampled individuals within herds, in relation to overall survey sensitivity (confidence level); e) consideration of the possibility to coordinate with other surveillance activities and f) a measure of the cost efficiency of the design (in comparison with the current design, if applicable). The objective is to implement a routine with revision of both the overall “surveillance basket” as well as the design of individual activities is carried out on a regular basis, to ensure that Swedish animal health surveillance remains fit for purpose with regards to the risks that challenge us.

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***The Network of Excellence for Epizootic Disease Diagnosis and Control (EpiZone):
Establishment and operation of the Network and an example of a Work Package***

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Establishment and operation of EPIZONE

EPIZONE is the Network of Excellence for Epizootic Disease Diagnosis and Control. This European Union (EU) funded research project officially started on 1 June 2006 and is supported by the EU's Sixth Research Framework Programme with a total EU contribution of EUR 14 million for a period of five years (June 2006–May 2011).

Epizone consists of 19 partners from 12 countries: CVI, The Netherlands (coordinator); FLI and HVS, Germany; IAH and VLA, United Kingdom; AFSSA and CIRAD, France; VET-DTU, Denmark; SVA, Sweden; CISA-INIA, Spain; IZS-Ve and IZLER, Italy; LVRI and HVRI, China; NVRI, Poland; SAP, Turkey; CODA-VAR, Belgium; FAO, Italy; DiVa, The Netherlands. Epizone has interactions and links to its stakeholders (national governments, EU, Industry), International bodies (FAO, WHO and OIE), related EU projects (EDEN, DICONTOOLS, EUFMD) and related Networks like MEDVETNET and OFFLU.

Epizone is managed via the Executive Committee and an external Advisory panel, a Management Advisory Board and a coordinating Forum.

EPIZONE aims to develop a network of scientists to improve research on preparedness, prevention, detection, and control of epizootic diseases within Europe. Therefore the economic and social impact of future outbreaks of foot-and-mouth disease (FMD), classical swine fever (CSF), avian influenza (AI), and other relevant epizootic diseases like bluetongue (BT) and African swine fever (ASF), can be reduced through increased excellence by collaboration. There are two major themes: horizontal and vertical integration activities. The horizontal integration activities comprises: 1) "Virtual Institute" (website); 2) Strategic Integration and 3) spreading Excellence (courses, workshops, annual scientific meetings). The vertical integration activities are subdivided into: 4) Diagnostics (Real time PCR-diagnostics; Chip-based diagnostics; DIVA Diagnostics; Pen-side tests for antigen or genome detection); 5) Intervention Strategies (vaccine technologies; host responses to infection; adjuvants; antivirals); 6) Surveillance and Epidemiology (emerging viral diseases in aquaculture; surveillance and epidemiology of AI and APMV; experimental epidemiology and molecular epidemiology); 7) Risk Assessment (Standardisation of import risk assessment; European online database on epizootic diseases as an early warning system; validation of a Clinical Decision Support System for CSF; impact of environmental effects on the risk of the occurrence of epizootic diseases in Europe: identification and prioritisation).

An example Work Package (WP): validation of a Clinical Decision Support System for CSF

The objective of this WP was to validate a clinical decision-support system (CDSS), developed in the Netherlands on an individual animal level, for early diagnosis of Classical Swine Fever (CSF) using the input of the WP partners.

The coordinator of this WP from CVI wrote a research proposal, which was reviewed by the Epizone management. For this WP, we contacted a selected number of possible partners of which we thought that they would be able to make a contribution to the project and asked them if they were interested to join. We started out with partners from Germany (FLI and HVS), Denmark (VET-DTU), Belgium (VAR-CODA), Italy (IZS-Ve), United Kingdom (VLA) and Poland (NVRI) and external experts (from University of Utrecht, Netherlands and the University of Ghent, Belgium). After 1.5 years, we said goodbye to the partner from Poland because they were not able to deliver their requested input.

The project was running on a budget of approximately EUR 90,000 per year, comprising costs for personnel (activities by partners), consumables, travel and accommodation and management of the WP.

In the first year, meetings were held in the partner countries to discuss CSF clinical-reasoning by CSF-experts using case-studies and estimating probabilities of CSF-disease processes.

Furthermore, in the following years partners were asked to record clinical signs – using a specific record clinical signs - using a specific protocol - in pigs during experimental infections with different CSF-strains that were planned anyway by the partners in the framework of their normal duties as reference laboratories. For this, our partners translated the protocols in their native language. We received valuable data from experiments done by HVS (Germany), VET-DTU (Denmark), VLA (United Kingdom) and CVI (Netherlands). These data were used to evaluate the sensitivity of the CDSS to detect a CSF outbreak.

In addition, the partners were helpful in recruiting a few private practitioners in their countries. These practitioners were asked to record clinical signs in pigs - using a specific protocol -when encountering a serious clinical problem on a pig farm (not CSF causing the problem as a first thought, but CSF could be in differential diagnosis). For this, our partners translated the protocols in their native language. These data were used to evaluate the specificity of the CDSS to detect a CSF outbreak.

Furthermore, via our partners we asked the State Veterinary Services to use our protocol to record clinical signs when they were investigating a clinical CSF-suspicion in their country. In the 4th year of the project, with the help of our partners we were able to develop the CDSS from individual pig level to farm-level.

Results were discussed at annual Epizone meetings and specific 2-day meetings held with the partners in the Netherlands. Annual reports of our activities within the project were submitted to the Epizone management and incorporated into an overall Annual Epizone Report each year. Each year, a work plan of activities and an accompanying budget for the coming year was drafted and submitted for review to the partners and the Epizone management.

A brief review of training courses in risk analysis for veterinarians in the Nordic-Baltic region

By Camilla Brasch Andersen – DVM, Danish Veterinary and Food Administration

One of the conclusions from the seminar on risk analysis in Oslo 2007 – arranged by the Nordic-Baltic veterinary contingency group – was that there is a great need for training programs that simultaneously involve risk assessors and risk managers. The aim of this review is to list available training courses in risk analysis and discuss if new strategies are needed.

Risk analysis is everything from complicated mathematical models made by specialists to qualitative risk assessments made on a farm level by the veterinarian present followed by the risk management and risk communication. This creates a great challenge to those planning the content of training courses in risk analysis since the participant's skills and needs vary a lot.

In order to do this review, an inquiry of the internet for training courses in veterinary risk analysis not only in the Nordic-Baltic area but in the whole world was done, and a number of experts in the area were asked if they were familiar with courses.

A great number of courses in risk analysis are available as well as risk analysis and courses in making them offered by private companies, but most of these are not related to the veterinary world.

Most of the existing courses with veterinary relevance are given ad hoc and not on a regular basis. This makes it complicated for the participant to plan course activity some time ahead. In most cases only information on courses planned for 2010 are currently available. The courses in 2010 will be presented at the seminar as these institutes are presumed to have the capacity to arrange similar courses in the future.

Quantitative risk assessments are a task for specialists while everyday assessments are made in the veterinary disease control by vets on the farms. The basic understanding of the analysis and the management and communication of the results should however be given to a wide range of governmental personnel. This calls for few courses on expert level and for a larger number of courses offering an introduction to the field. However, discussion on risk analysis between risk assessors and risk managers is very important as well, and meetings with such an agenda should also be prioritized in order to enhance the understanding between the groups and strengthen the collaboration.

Meetings to compare risk analysis between countries and to discuss experiences gained etc. could be beneficial, in addition to the training courses mentioned above. This could provide a better understanding of risk assessment and management in the neighbouring countries and strengthen networks between the relatively small groups of people in the field. In a time with increasing international trade and new emerging diseases this could be one of the ways to keep a good animal health in the future.

Evaluation

Table 14: Evaluation

	Evaluation scale: 1-poor, 5-excellent				
	1	2	3	4	5
Did the seminar meet your expectations?	0	1	6	9	7
Did you feel you had the necessary prerequisites for (knowledge, skills, etc) to be able to benefit from the seminar?	0	0	6	13	5
Was the level of the seminar satisfactory?	0	1	7	9	6
How did you find the supplied material, abstract, handouts, etc?	0	0	6	10	8
Was the seminar relevant for you?	0	2	3	11	8
Overall, how did you find the seminar?	0	0	4	11	9

Complementary comments

Many of the participants made a remark on a too tight time schedule and that they would have liked to have more time for discussion. Most of them liked the work-shop part of the seminar very much and the talks where the speakers had good practical examples. They felt that there was a good dialogue and atmosphere between people and were generally pleased with the seminar.

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The organizing Committee

The risk seminar was organized by the Nordic-Baltic Veterinary Contingency Group having the following members:

- Jessica Eriksson-Løfgren: Evira, Finland
- Maarja Kristian: Veterinary and Food Board, Estonia
- Edvins Olsevskis: Food and Veterinary Services, Latvia
- Egidijus Pumputis: State Food and Veterinary Services, Lithuania
- Joakim Holmdahl: Swedish Board of Agriculture, Sweden
- Elisabet Lindal: Swedish Board of Agriculture, Sweden
- Hanne M. Hansen: Veterinary and Food Administration, Denmark
- Camilla Brasch Andersen: Veterinary and Food Administration, Denmark
- Audur Arnthorsdottir: Food and Veterinary Authority, Iceland
- Siri Lotvedt: Food Safety Authority, Norway
- Jørgen Westergaard: ADC-consult, Denmark (Employed by the organizing committee as private consultant)
- Audur Arnthorsdottir, Hanne M. Hansen and Camilla Brasch Andersen were the executive committee.

Report on the workshop: Strengthening and adaption of the preventive measures to existing risks of African swine fever introduction from Eastern neighbouring countries to Nordic-Baltic Region

Sigulda, Latvia, 29– 31 October 2012

Abstract: The application of preventive measures against the entrance of African swine fever in the Nordic-Baltic region was a vital issue in 2012 due to the presence of the disease in countries on the eastern border of Finland, Estonia, Latvia and Lithuania. The seminar addressed a large number of factors relevant for disease introduction such as: movement of wild boar, illegal movements of meat and other products originating from pigs, disease surveillance in domestic pigs and in wild boar, biosecurity at farm level, cooperation between the veterinary sector, the hunters and game keepers.

<i>Report on the workshop: Strengthening and adaption of the preventive measures to existing risks of African swine fever introduction from Eastern neighbouring countries to Nordic-Baltic Region</i>	153
Report of the workshop	154
Conclusions of the workshop	158
List of participants	160
Workshop	161

Report of the workshop

Session 1. Analysis of the situation of African swine fever in the Russian Federation and the potential threat of invasion of ASF virus into the Nordic-Baltic region

Deputy Director General Kristine Lamberg, Food and Veterinary Service, Latvia welcomed the participants and opened the seminar. The seminar was supported by the Nordic-Baltic Veterinary Contingency Group (NBVCG).

Edvins Olsevskis, Food and Veterinary Service in Latvia, described the targets for the seminar which were as follows:

- to evaluate the current surveillance and control activities and existing strategy on ASF in participating countries;
- to get a real picture on the epidemiological situation of ASF in the eastern neighboring countries;
- to evaluate the effectiveness of preventive measures;
- to prepare conclusions and recommendations for improvement of preventive measures in the relevant countries and in the Nordic-Baltic region as a whole.

Dr. Janis Ozolins, State Forest Service in Latvia, described the status of wild boar in Latvia including their biology and the management system. The population is high, around 80,000, but still increasing and the hunting bag is nearly 30,000. The risk level of the population density has been reached already. The wild boars are highly adaptive to various environments and in good circumstances they can breed the whole year around. Sufficient exchange of information between the risk managers and the hunters is essential.

The epidemiology of African swine fever and the situation in the Russian Federation was comprehensively highlighted by Dr. Dudnikov and Dr. Oganessian from ARRIAH, Russia. Two periods can be recognized in the spread of ASF in Russia: The first one in 2007–2010 and the second one with remarkable spread since 2011. At the present the disease is spreading approximately 200 km forward each year and has a tendency to spread both westwards and eastwards. Until 2010, the only endemic area was in the Caucasus region and only three outbreaks had been detected outside it. In 2011, the situation changed and another endemic zone was established in the Tverskaja Oblast, at the level of the Baltic countries. In the north, in St Petersburg's region, Karelia and Murmansk, a few outbreaks have been detected each year in 2008–2012, but the Veterinary Services have been able to eradicate the disease every time and the north-western part of Russia is not considered endemic.

Whereas genotype I is the only ASFV genotype known to have spread outside the African continent in the past, the current epidemic in Russia is caused by a genotype II virus originating in south-eastern Africa (Madagascar-Mozambique). The virus causes a devastating acute form of the disease where serological testing is of little use when

diagnosing the disease. No significant genetic changes have occurred in the past five years and no subacute or chronic forms of disease have been detected. The clinical symptoms before death and the pathological findings have been vague, on the contrary to what normally is described in the literature (to a large extent based on experiences from Spain and Portugal). This has complicated the detection of the disease and lead delayed detection and action. Also meat from the farms may have been sold forward before the disease has been officially confirmed.

Most cases of ASF in Russia have occurred in small family farms where no biosecurity measures are applied. Only 15% of the cases have occurred in commercial farms with good biosecurity and 32% in wild boar. Altogether, 361 outbreaks have been confirmed so far. A nationwide control program would be a prerequisite for an efficient eradication of the disease. When considering the risks in the Eastern Europe, it should be taken into account that the number of farms with low biosecurity is high both in Russia and the countries bordering it.

The vaccines cannot be seen as a solution to the control of the disease in near future as there are still many obstacles in the development of them.

The wild boars are considered to be the victim of the disease, not the cause and the disease would not sustain in wild boars if eradicated from the domestic pigs. ASF infection in the European wild boar leads always to death. In 2011, a monitoring project on ASF in wild boar was carried out and altogether 11,000 wild boar were shot and tested in the European part of Russia. As a result, there were only a few positive samples which all originated in the Caucasus endemic region. In 2012, positive samples were detected also in the Tver endemic region.

Three different soft tick species are prevalent in Russia and only one of them could in theory be problematic locally. However, it seems that the ticks have no role in the epidemiology of this disease in Russia.

Leva Rodze, Institute of Food Safety, Animal Health and Environment (BIOR) in Latvia, gave a presentation on the surveillance of ASF in Latvia as well as on the methods available for ASF laboratory diagnostics. In 2011, 196 serological samples were tested from wild boar. Conventional PCR method is available (detection of highly conserved region of genome (VP72) as well as the Elisa test (blocking Elisa and the indirect Elisa) and the immunoblotting test (WB). She also emphasized the need to evaluate the specificity of the serology and the PCR test with the Russian virus isolates. A simulation exercise to evaluate the laboratory capacity is under consideration in Latvia.

Session 2. Review of existing ASF surveillance programs and activities in the field of risk assessments carried out by partner's competent veterinary authorities

Sten Mortensen, Danish Veterinary and Food Administration, gave a presentation on the structure of the pig sector and the management of the pig farms in Denmark. There are 13 million pigs and 9,200 pig farms and altogether 22 million pigs are slaughtered per year. There is a health advisory contract system in the pig farming sector and 75% of piglets are born in farms with a Specific Pathogen Free (SPF) status. Biosecurity plans are required in large farms. The number of wild boar is low, 50–100.

Denmark is an exporting country and 20,000 truckloads are exported annually. Altogether 100,000 sows and 200–400,000 pigs are slaughtered in German slaughterhouses. In addition, 8 million piglets and 100,000 breeding animals are exported. Transport vehicles coming to Denmark are often registered abroad. Also, the workers in the Danish agriculture and horticulture often come from abroad, mainly from Ukraine, but also from other eastern European countries. There are Danish farms abroad and it would be important to identify them and exchange information with them on the ASF situation and the risks related to it.

The laboratory methods used for the detection of the virus are the isolation in macrophages and PCR and for the detection of antibodies the blocking Elisa, the immunoperoxidase test and the immunoblotting test (from the EU ref. lab). In 2011, analysis of 3,511 samples was carried out.

Risk assessment procedures are in place concerning all ASF outbreaks in Europe including scanning of risks specific to the incident and risk mitigating measures decided based on the information.

Dr. Jonna Kyörö, Finnish Food Safety Authority Evira, described the risk profile on ASF carried out in Finland. She recommended all countries to draw up a risk profile of their own which takes into account the national circumstances. The risk factors identified in the risk profile were personal contacts in the infected areas abroad, import of pigs and semen, import of meat and meat products, illegal swill feeding, wild boar, contaminated trucks and international catering waste unless destroyed as required.

Taina Aaltonen, Evira, Finland, informed of the preventive and control measures enforced as well as the surveillance carried out. The number of wild boar is low, only some 200–300 animals. Export and import of domestic pigs is very limited. Most of the pigfarms have joined the voluntary health care program (SIKAVA) run by the industry. There has been an information campaign in several languages to increase the awareness at farm level, among veterinarians, tourists and hunters. The diagnostic methods available in Finland are the antibody Elisa, antigen Elisa and PCR.

Marius Masiulis, Lithuania explained the national control system for animal health in Lithuania which is based on contracts between the private veterinary practitioners and the farmers. The control organization was centralized on 1 July in 2011 when the regions became units of the Central Authority. With regard to disease surveillance, the central authority defines the priorities for contagious diseases and draws up the national surveillance plan. Sampling has been increased in the risk areas: every wild boar will be tested and all the back yards are investigated. More than 3,000 samples have been taken from the back yards and 1,000 samples from wild boars from the

bordering regions. Experiences from the previous cases of CSF in 2009 and 2011 have been carefully examined and taken into account in the revision of the contingency plans. Biosecurity measures have been strengthened and additional inspections have been carried out in pig holdings to check the biosecurity measures.

Helen Prommik, Estonia informed of the surveillance activities in the hunted wild boar, breeding animals and AI- centres in Estonia. A risk profile has also been drawn up. Based on it, the following risk factors were identified: migration of wild boar, illegal import of an infected pig from Russia, contaminated vehicles for animal transportation from Russia and illegal transportation of food (personal consumption mainly).

Edvins Olsevskis, Latvia gave a description of the structure of the Food and Veterinary Service in Latvia and the duties of the Veterinary Surveillance department. The wild boar surveillance is carried out in the eastern regions. Compensation has been paid to the hunters for providing the samples (blood and organs) to the laboratory. A simulation exercise was carried out in May 2011 and the Nordic-Baltic Contingency group arranged a common simulation exercise in the Nordic-Baltic countries in October 2011.

Iveta Zemniece from the Border Control in Food and Veterinary Service in Latvia explained the arrangements in BIP's. The co-operation with the Customs has been increased due to the increased risk on ASF and if necessary, 100% control of personal luggage can be required. The animal transport vehicles have been checked regularly at the BIP's as required by the EU legislation and warnings have been given, when necessary. Unfortunately, insufficient cleaning and dirty trucks have been detected. Also, import rules are not sufficiently known by travelers as meat and meat products are voluntarily transferred for destruction at the BIP's. Special actions have been launched to improve the situation.

Session 3. Analysis of the situation concerning ASF in the Nordic-Baltic area

Analysis of the risks, preventive and control measures, surveillance and biosecurity in the Nordic-Baltic region was carried out in four working groups and the conclusions and recommendations of the seminar were based on this work.

Conclusions of the workshop

The largest risks identified with regard to introduction of African swine fever into the Nordic-Baltic area

The priorities were different depending on the country. The main risks identified were:

- illegal meat and meat products;
- farm workers from infected areas in European farms;
- illegal swill feeding or unintentional exposure of kitchen waste to pigs or wild boars;
- animal transport vehicles returning from infected areas and not properly cleaned and disinfected including their drivers;
- cross border movements of infected wild boar.

There are still knowledge gaps related to these activities (e.g. amount of illegal activities, amount of travelling, awareness of foreign workers concerning the risks, ecology of infected wild boars, extent of illegal swill feeding) to be able to quantify the risks comprehensively.

Remarks concerning the present situation regarding the preventive measures in force

The Commission Decision (2011/78/EU) on certain measures to prevent the transmission of the African swine fever virus from Russia to the Union has been implemented in the BIP's but there are still deficiencies in the quality of the cleaning and dirty trucks can be found. It should be recognized that there may also be risks related to airports and other cross border points as contaminated material can arrive also via these routes.

Large quantities of illegal meat and meat products are seized at the borders annually.

Some countries have legal requirements concerning biosecurity at farm level, others don't. However, in some countries there are industry-driven biosecurity rules destined for commercial farms and they are controlled by the industry itself.

The back yard farms may not be covered by these rules and according to the previous experiences these farms are at most risk.

The wild boar population is very large in some areas and the density high and this poses a risk in the spreading of the disease in case of an outbreak.

The relevance of farming wild boar in countries with a large wild boar population was questioned.

Recommendations

Cleaning and disinfection facilities for animal transport trucks are needed close to the BIP's. Financial support from EU Commission would facilitate the establishment of such places.

Sufficient resources should be guaranteed at the BIP's and risk- based inspections enforced.

Continuous information delivery and awareness campaigns concerning the risks related to various activities like illegal import of meat products are needed.

Minimum biosecurity measures should be established in all farms. This should be taken into account in the preparation of the animal health legislation.

The density of the wild boar population should be monitored and kept in a natural level. The feeding of wild boar is not recommended.

Outbreak assessments should be performed by the Veterinary Services in response to ASF outbreaks in newly infected areas to identify the immediate threats.

Information gaps should be filled in and systematic studies carried out. Information campaigns should be focused on the known risks.

Remarks on the present situation regarding the surveillance on ASF of domestic pigs and wild boar

The laboratories have adequate diagnostic methods to conduct the required testing but the capacity needs to be assessed.

The virus spreading in Russia (Georgian 2007) is a highly virulent strain with high mortality without prior clinical signs and with minor pathological findings. Pigs and wild boars may die before seroconverting and very low seroprevalence are detected even in endemic areas.

A low number of reported suspicions is reality in all countries and the effectiveness of passive surveillance is difficult to evaluate. However, complementary sampling to exclude the disease is carried out in the reference laboratories.

There is likely to be a lack of knowledge on ASF among hunters and gamekeepers even if efforts on delivering information have been carried out.

Recommendations

Laboratories are encouraged to carry out simulation exercises to test their capacity in case of an epidemic. The EU reference laboratory should be encouraged to include all the relevant virus genotypes in the inter-laboratory tests arranged.

Active surveillance implemented in countries is not likely to detect the disease in its early phase. Therefore, passive surveillance should be emphasized and special attention to be paid to increased mortalities.

Risk-based surveillance systems to send samples of dead and diseased pigs with unspecific clinical signs should be established and submission of samples should be encouraged.

Samples should be acquired from dead and shot wild boars regularly.

Better co-operation should be established between the veterinary sector, the hunters and game keepers to exchange information on the disease, increased mortality, biology and ecology of the wild boar. This should also be extended to neighboring countries.

List of participants

Table 16: List of participants

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Workshop

Strengthening and adaptation of the preventive measures to existing risks of African swine fever introduction from Eastern neighbouring countries to Nordic-Baltic region.

Location: Sigulda (Latvia) – October 29–31, 2012.

Table 17: Agenda

Time	Subject and speakers
Monday, October 29	
13.00	Lunch
14.00–16.00	Session 1. <ul style="list-style-type: none"> 1. The analysis of situation of African swine fever (ASF) in Russian Federation and potential threat of invasion ASF virus into Nordic Baltic region. 1.1. Introduction on ASF (E.Olseviskis FVS Latvia) (15 min). 1.2. Wild boar biology in Latvia (Dr. J.Ozolins, SFS, Latvia) (40 min). 1.3. The characterization of strategy, implemented control measures and problems.... – “Epidemiology of ASF in the Russian Federation: current situation” (Dr. Dudnicov ARRIAH, RF). <p>Break 20–30 min.</p>
16.20–18.00	<ul style="list-style-type: none"> 1.4. Possible development trends of situation posing risk to Nordic-Baltic region. “ASF in the Russian Federation: trends and risks” (A. Oganessian ARRIAH, RF). 1.5. Discussion. 1.6. Methods available for ASF laboratory diagnostics in Latvia (Dr. I.Rodze – NRL, Latvia) (20 min).
19.00	Dinner
Tuesday, October 30	
9.00–12.30	Session 2. <ul style="list-style-type: none"> 2. Review of existing ASF surveillance programs and activities in the field of risk assessments carried out by the partners’ competent veterinary authorities. 2.1. Experts from competent veterinary authorities (DVFA, Evira, FVS + LT and EE) present existing ASF surveillance programs and the activities in the field of on risk assessment covering both the production sector and wildlife + review of prophylactic measures in place (including border control BIPs) and control measures. (DK, FIN, LV, LT and EE, each country ~30 min). 2.2. Discussion (30 min). 2.3. Designation of working groups for group work during afternoon and issues for discussion (30 min).
12.30–13.30	Lunch
13.30–15.30	Session 3. <ul style="list-style-type: none"> 3. Analysis of effectiveness of surveillance, prophylactic and designed control measures in partners’ countries. <p>Analysis session – group work to evaluate current system and determine the strengths and weaknesses in surveillance and control systems of N-B countries bordering RF and BLR (~90 min). Drafting recommendations for effective strategy in order to improve the surveillance programs and preventive measures for ASF.</p> <p>Strategy session – group work (same groups): presentation of results from each group, brain storming for drafting conclusions, suggestions and recommendations for an effective strategy based on the outcome of the above described analysis (60 min). Break (30 min).</p>

Time	Subject and speakers
15.30–18.00	<p>Development of effective prophylactic measures and strategy aimed at prevention of Nordic Baltic region from ASF introduction from eastern neighboring countries.</p> <p>5.1. To elaborate the scope of prophylactic measures against introduction ASF agent in the territory of the Nordic Baltic region.</p> <p>5.2. To describe implementation procedure of prophylactic measures and elaborate effective strategy for improvement of surveillance and control measures in Nordic-Baltic region in order to protect it from very dangerous and lethal diseases (90 min).</p>
19.00	<i>Dinner</i>
Wednesday, October 31	
9.00–13.00	<p>Preparation of final document with the recommendations for effective strategy including surveillance, prophylactic measures and the mutual cooperation in the future. The final document will be submitted to partners' Chief Veterinary Officers for endorsement.</p> <p>Excursion to Sigulda (~2 hours)</p>
13.00–14.00	<i>Lunch</i>

Publications prepared by the Nordic-Baltic Veterinary Contingency Group 2012–2017

- 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. Copenhagen: Nordic Council of Ministers. <https://doi.org/10.6027/TN2017-539>
- 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. Copenhagen: Nordic Council of Ministers. <https://doi.org/10.6027/TN2016-504>
- 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 4th–5th December 2013, Bergen, Norway ISSN 0908-6692 – TemaNord 2014:571. Copenhagen: Nordic Council of Ministers. <https://doi.org/10.6027/TN2014-571>
- 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 ISSN 0908-6692 – TemaNord 2014:508. Copenhagen: Nordic Council of Ministers. <https://doi.org/10.6027/TN2014-508>
- 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 ISSN 0908-6692– TemaNord 2014:509. Copenhagen: Nordic Council of Ministers. <https://doi.org/10.6027/TN2014-509>
- 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 – Nordic Working Papers NA2013:926. Copenhagen: Nordic Council of Ministers. <https://doi.org/10.6027/NA2013-926>
- 2012: *Exercise AUTUMN-2011*, Nordic – Baltic African Swine Fever Exercise, October 2011, Nordic Working Papers NA2013:907; – Nordic Working Papers NA2013:907. Copenhagen: Nordic Council of Ministers. <https://doi.org/10.6027/NA2013-907>

Sammendrag

Det Nordiske Råd for Fiskeri, Havbrug, Jordbrug, og Skovbrug (MR-FJLS) vedtog i 2006 en strategiplan vedrørende veterinært beredskab i Norden. Formålet med planen var at styrke et samarbejde, der kunne:

- Styrke de nordiske landes bestræbelser på at opretholde og videreudvikle det høje stadi vedr. dyre sundhed og dyre velfærd.
- Styrke landenes bestræbelser på at fremme nordiske synspunkter vedrørende dyre sundhed og dyre velfærd i en global sammenhæng.

Strategiplanen resulterede i etableringen af den Nordisk Baltiske Veterinære Beredskabs Gruppe, som siden 2006 har arbejdet med det formål:

- At forbedre samarbejde, kommunikation, og udveksling af informationer og erfaringer mellem de veterinære administrationer i den Nordisk Baltiske region, inden for rammerne af beredskabsplanlægning og i bekæmpelse af husdyrsygdomme.
- At øge viden blandt personer, der passer dyr og andre, der er beskæftiget i husdyrsektoren med hensyn til husdyrsygdomstrusler og forekomsten af nye sygdomme hos dyr.

Med henblik på at opfylde de ovenfor nævnte formål har den Nordisk Baltiske Veterinære Beredskabs Gruppe udført arbejde, der har resulteret i:

- Internationale seminarer; emnerne for seminar har omfattet risiko analyser, vektorbårne sygdomme, risikobaseret overvågning og beredskabsplanlægning; den vilde fauna, infektiøse sygdomme hos dyr og smittebeskyttelsesforanstaltninger.
- Internationale beredskabsøvelser, som omfattede mund- og klovesyge, blutongue, West Nil feber, Afrikansk svinepest og Egtvedsyge.
- Workshops, som behandlede emnerne: forberedelse af beredskabsøvelser, ekspert gruppe for eksotiske sygdomme, hurtige kvalitative risiko vurderinger til brug for nationale veterinære administrationer.

Denne publikation udarbejdet af den Nordisk Baltiske Veterinære Beredskabs Gruppe indeholder et udvalg af rapporter og dokumenter, som ikke tidligere er stillet til rådighed for læsere af publikationer udsendt af Nordisk Ministerråd. Publikationer, som belyser betydningen af sygdomsforebyggelse, beredskab samt at det er afgørende at

forekomsten af en eksotisk sygdom bekræftes så hurtigt som muligt og førend sygdommen breder sig i et eller flere af de Nordisk Baltiske lande.

Den Nordisk Baltiske Veterinære Beredskabs Gruppe vil her give udtryk for sin tak til det Nordiske Ministerråd for den politiske og økonomiske støtte til arbejdet med veterinær beredskabs planlægning. I denne forbindelse må det fremhæves, at med globalisering, global opvarmning, hurtige ændringer i husdyr produktion, nye og bedre diagnostiske metoder og bedre vacciner er der et stort behov for et tæt samarbejde, idet sygdomme ikke respekterer landegrænser. Strategiplanen, der blev vedtaget af Ministerrådet i 2006, er stadig meget værdifuld.

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NORDIC VETERINARY CONTINGENCY PLANNING

Contingency planning within the area of animal health is based on four pillars: prevention, preparation, response and recovery. The objectives include to encourage animal keepers, veterinarians, producers of food and feed, consumers, private and public institutions involved in food safety to address in the daily work animal disease prevention and possible response related to disease threats and outbreaks.

In 2006, the Nordic Council of Ministers (NCM) adopted a strategy plan to enhance veterinary contingency planning in the Nordic and Baltic countries resulting in the creation of the Nordic-Baltic Veterinary Contingency Group. This publication provides information on contingency planning based on the conduct of seminars, workshops and simulation exercises during 2007 – 2011, not previously available to readers of publications issued by NCM.

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