

## ANIMAL HEALTH AND WELFARE UNIT

### **MINUTES OF THE 63<sup>rd</sup> PLENARY MEETING OF THE PANEL ON ANIMAL HEALTH AND WELFARE (AHAW)**

**09-10 February 2012, Parma**

#### **1. PARTICIPANTS**

##### **AHAW PANEL MEMBERS**

Anette Bøtner, Don Broom, Marcus Doherr, Mariano Domingo, Jörg Hartung, Linda Keeling, Frank Koenen, Simon More, David Morton, Pascal Oltenacu, Fulvio Salati, Mo Salman, Moez Sanaa, Mike Sharp, Jan Arend Stegeman, Endre Szücs, Hans-Hermann Thulke, Philippe Vannier, John Webster, and Martin Wierup.

##### **AHAW UNIT**

Ana Afonso, Franck Berthe, Sofie Dhollander, Chiara Fabris, Milen Georgiev, Andrea Gervelmeyer, Tomasz Grudnik, Per Have, and Karen Mackay.

##### **EUROPEAN COMMISSION, DG SANCO**

Marina Marini (phone, Unit 03, Science and Stakeholders), Judit Kromer and Denis Simonin (phone, Unit G3, Animal Welfare).

#### **2. OPENING, APOLOGIES AND AGENDA**

Philippe Vannier, chair of the AHAW Panel, welcomed the Panel members.

The agenda was adopted.

#### **3. DECLARATIONS OF INTEREST**

In accordance with EFSA's Policy on Declarations of Interests (DoI), EFSA screened the Annual and Specific Declaration of Interest (SDOI) provided by the Panel Members for the present meeting. No new interests were declared in the SDOIs submitted in relation to the current agenda.

Marcus Doherr declared a conflict of interest in relation to point on Tuberculosis testing. The interest is declared in the SDOI.

The other Panel Members confirmed that no further declarations of interests were to be made in the context of the adopted agenda.

#### 4. MINUTES FROM THE PREVIOUS PLENARY MEETING

The minutes of the 62<sup>nd</sup> plenary meeting of the AHAW Panel were published on the EFSA website<sup>1</sup>.

#### 5. NEW MANDATES

Marina Marini briefly presented upcoming new requests to the Panel on Rift Valley Fever, *Echinococcus multilocularis* and also animal welfare aspects of fish transport.

#### 6. DRAFT OPINIONS SUBMITTED FOR DISCUSSION

##### 6.1. Swine Vesicular Disease (SVD) and Vesicular Stomatitis (VS)

**The mandate:** in June 27 2010, the European Commission sent a mandate requesting EFSA to develop an opinion concerning Swine Vesicular Disease (SVD) and Vesicular Stomatitis (VS). A initial meeting was requested to DG SANCO for clarification of the mandate and its ToR (6 July). The EC explained the background and main purpose of this mandate. Given that current diagnostic methods allow for a rapid differentiation between FMD and SVD and VS, the COM would like to reassess appropriate and proportionate surveillance/ control measures for these diseases. The impact of these two diseases will be assessed initially. The deadline requested is March 31, 2011. The EC agreed that the opinion should not address all the proposed Terms of reference but focus on the significance of the presence, origin and occurrence of SVD and its actual impact on livestock as a disease, separated from its impact related to trade, in particular in terms of the current EU epidemiological situation; an assessment of the risk of the spread of SVD within EU and the risk of new introductions of SVD into the EU especially by animals and animal products; the significance of the presence and occurrence of VS in susceptible species (specially livestock animals) outside EU and the significance of a potential introduction of VS in the EU and its potential impact on EU livestock, including equidae, in the context of the current epidemiological situation and, finally, an assessment of the risk of introduction and spread of VS in the EU, especially by animals, animal products and vectors and an assessment of the risk of an epidemic or virus persistence being maintained in the EU, considering livestock which includes equidae, epidemiology, vectors and climatic situation. It was further agreed to assess the remaining questions raised in the mandate in a separate opinion should the results of the initial assessments define a significant impact of these diseases. This approach was confirmed at the AHAW panel plenary meeting on 10 February based on the discussion of the draft opinion.

**The approach:** The approach was presented to the Panel at the October plenary meeting. Information on the impact of the diseases on animal health, animal production and the spread of the diseases was collected through a systematic literature review and a questionnaire for affected countries. Questionnaires on the impact of SVD have been sent

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<sup>1</sup> <http://www.efsa.europa.eu/en/events/event/111019a-m.pdf>

to selected EU MS (Portugal, Netherlands, Italy, and Spain), and countries affected by VS in the Americas (USA, Colombia, Costa Rica, El Salvador) and Panaftosa. Data gathered by these means was used for a structured impact and spread model for which a procurement for the adaptation of an existing model was issued. The SAS unit of EFSA prepared a model for assessing the risk of introduction of VS to the EU through the import of live animals.

Frank Koenen gave a presentation of the comments received from the AHAW panel and the European Commission and the amendments proposed. The panel highlighted the need to be consistent on the risk characterization terms. To this end, the risk characterisation terms defined by OIE and used already in the EFSA opinion on African Swine Fever were also applied in this opinion.

The opinion will be submitted to the Panel for possible adoption in March.

## 6.2. Foot and Mouth Disease (FMD)

**The mandate:** after request from Bulgaria BFSA-RAC and Commission on FMD and in application of Regulations 178/2002 and 1304/2003 concerning requests from different parties on an issue, EFSA proposed to address the questions in one single opinion. The two requests were discussed in a tri-partite meeting with a view to allow for a coordinated approach and response to questions arising from the current situation in the Balkans. It was agreed that mandate should address the following terms of reference:

1. The relative significance of -and the role played by- wild and feral bi-ungulates, notably wild boar and deer species in the epidemiology of foot and mouth disease (FMD) in Thrace (Bulgaria, Turkey and Greece), taking into account the different FMD virus strains circulating in the region.
2. The risk factors and other relevant epidemiological features, in particular for the different FMD virus strains circulating in Thrace (Bulgaria, Turkey and Greece) which must be taken into account for the design of surveillance systems (including estimation of advantages and disadvantages), that could be implemented for the early detection of any FMD virus incursion in the territory of Thrace (Bulgaria, Turkey and Greece).
3. The relevance and significance of epidemiological data and genetic characteristics for the different FMD strains recently isolated in Bulgaria and Turkey, with regards to the hypothesis of single versus multiple introductions to Bulgaria.

**The approach:** The approach was presented to the Panel at the October plenary meeting.

**ToR 1**, relating to the relative significance and the role played by wild ungulates in the epidemiology of FMD in Thrace, the opinion describes first the necessary background information to understand the epidemiology of FMD in Thrace and the risk factors for introduction of the disease. The opinion provides a systematic literature review of FMD observations in wild boar and deer, both on a population level, as on an individual animal level, the latter describing FMDV infection dynamics in wild boar and deer. Furthermore, the FMD virus characteristics are described in the SO. Some of the background information given was used to fit into a dynamic, spatially explicit, individual-based eco- epidemiological

model, addressing the possible maintenance of a FMDV incursion into an area populated by wildlife (i.e. wild boar and/or deer).

**ToR 2**, concerning the risk factors that need to be taken into account for designing surveillance systems, is answered firstly by listing the most important risk factors for introduction of FMD in Thrace. During the course of preparing this Scientific Opinion, it was considered by both the requestors of the Scientific Opinion and the AHAW Panel that guidelines for passive and active surveillance for early detection of FMD in domestic animals were already sufficiently developed.

However, targeted surveillance systems in wildlife for early detection of new FMDV incursions do not exist. It is up to the competent authority of the affected Member State to develop and present plans for surveillance, control and eradication of FMD in wild animals in an affected area. A model was developed to assess the suitability of different surveillance systems for early detection of FMD incursions in wildlife. The advantages and disadvantages of the different surveillance systems were provided.

**ToR 3:** The relevance and significance of epidemiological data and genetic characteristics for the different FMD strains recently isolated in Bulgaria and Turkey, with regards to the hypothesis of single versus multiple introductions to Bulgaria. This TOR is answered by a narrative discussion. First the heterogeneity and the genetic characterization of FMDV's involved in Thrace of FMDV is discussed, and then the genetic and epidemiological information about the spread of the virus in Thrace was combined to discuss the likelihood of single versus multiple introduction of the virus in Bulgaria.

The opinion will be submitted to the Panel for possible adoption in March.

### **6.3. Electrical requirements for waterbath stunning of poultry**

**The mandate:** in June 2011, EFSA received a mandate on electrical requirements for waterbath stunning of poultry. The Commission had received information from British and Dutch authorities that might justify amending the electrical requirements for waterbath stunning of poultry laid down in Table 2 of Chapter II of Annex I to Regulation (EC) No 1099/2009. EFSA is tasked to review relevant new scientific references on electrical stunning of poultry and in particular the ones provided by the British and Dutch authorities and to recommend, if necessary, new electrical requirements applicable for waterbath stunning equipment laid down in Table 2 of Chapter II of Annex I to Regulation (EC) No 1099/2009.

**The approach:** A technical hearing was held on September 23 2011, at which British and Dutch scientists explained their findings that led to the requests of their authorities. A systematic review of scientific references on waterbath stunning of poultry was carried out to collate the scientific evidence for electrical requirements of waterbath stunning of poultry in line with requirements of Article 4, Regulation (EC) No 1099/2009 by EFSA staff. The draft opinion was discussed at the plenary meeting in December 2011. A second technical hearing was held in January 2012 to discuss the findings of the systematic literature review with the hearing experts.

The mandate focuses only on the electrical requirements applicable for waterbath stunning equipment laid down in Table 2 of Chapter II of Annex I to Regulation (EC) No 1099/2009. It was agreed not to limit data extraction to studies describing electrical settings which result in 100% successful and irreversible stuns. Quality issues related to electrical stunning were out of the scope of this mandate.

The draft opinion was discussed with particular focus on the definition of an effective stun and the drafted conclusions and recommendations.

All the comments from the Panel and the EC were taken on board.

Due to the many changes that were introduced the panel felt that a careful consideration is necessary and the opinion will be resubmitted for possible adoption at the next plenary.

The opinion will be submitted to the Panel for possible adoption in March.

## 7. PROGRESS REPORT ON ONGOING MANDATES

### 7.1. Update the scientific opinions on the welfare of beef cattle and the welfare of intensive calf farming systems

**The mandate:** in March 2011, EFSA received a mandate to update the scientific opinions concerning the welfare of beef cattle and calves. In particular to consider if the conclusions and recommendations of the two previous scientific opinions on the "Welfare of cattle kept for beef production" (SCHAW, 2001) and "The risks of poor welfare in intensive calf farming systems" (EFSA, 2006) are still valid. Only the animal categories of these previous scientific opinions should be considered in the update.

**The approach:** A comprehensive scientific review of bibliographic references on the welfare of beef cattle and calves was outsourced (NP/EFSA/AHAW/2011/04) and its results circulated to the working group. Separate risk assessments will be performed for beef cattle and calves. In calves, hazards and animal categories from the previous scientific opinion will be considered as starting point. The update shall contain only new data (from 2001 in beef cattle and from 2005 in calves) not included in the above mentioned scientific opinions and new conclusions and recommendations from these data. The validity of the previous conclusions and recommendations should be also considered. The draft opinion was discussed at the plenary meeting and will be submitted after review of all comments received for possible adoption in April 2012.

**Discussion:** The scientific opinion has been draft following the ToR: to update the scientific knowledge of the welfare of cattle kept for beef production and the welfare of intensive calf farming systems, in particular to consider if the conclusions and recommendations of the two previous scientific opinions are still valid, focusing the update to the animal categories and farming systems of the referred opinions (SCAHAW, 2001; EFSA, 2006). The structure of the previous opinions has been maintained and references before 2001 for beef cattle and before 2005 for calves have been added just when considered critically important. For each

section, the new information was evaluated with respect to the conclusions and recommendations of the previous opinion:

- when it was necessary to append the previous conclusion and/or add a new one, the section was labelled as "*New information added to the text of section XX of previous opinion*".
- when the new information did not critically affect the previous conclusions, the section was labelled as "*No critical new information to section XX of previous opinion*".
- when new information addressed an issue not covered in the previous opinion, a new section was created and labelled as "*New section*".

Risk assessment was performed for beef cattle and for calves using a structured protocol based on the EFSA Guidance (2012). In the case of calves' chapter, the outcomes were compared with the outcomes of the previous risk assessment (EFSA, 2006). The outcomes will be the base for a for a subsequent mandate to evaluate the use of animal based measures to assess welfare of cattle kept for beef production and of calves in intensive farming systems to be completed before the end of the year, already addressed in the current mandate

## 7.2. Public health hazards to be covered by inspection of meat (POULTRY)

**The mandate:** The Commission requested a scientific opinion and technical assistance on the public health hazards to be covered by inspection of meat. The scope of this mandate is to evaluate meat inspection in a public health context. The following species or groups of species should be considered: domestic swine (deadline September 2011), poultry (deadline June 2012), bovine animals over six weeks old, bovine animals under six weeks old (deadline June 2013), domestic sheep and goats (deadline June 2013), farmed game (deadline June 2013) and domestic solipeds (deadline June 2013).

**The approach:** The AHAW Panel ensures whether any change in current inspection does not jeopardize the capacity to detect animal diseases nor compliance with the animal welfare regulation. For this, it is essential to determine the importance and integration of meat inspection in the EU animal health surveillance and monitoring. Two methodologies (qualitative and quantitative) are in use to assess the quality of both the current and proposed modified meat inspection systems. The former relied on expert opinion and a review of the literature, and the latter used a three stage modelling approach.

**Poultry (EFSA-Q-2011-00019).** The draft of AHAW annex to EFSA opinion on meat inspection poultry was presented and discussed thoroughly in AHAW Panel. The draft opinion of AHAW is focused on the AHAW implications of changes in meat inspection as proposed by BIOHAZ and CONTAM Panels in the light of public health hazards. There were two main directions of the 'what if' analysis in AHAW (i) ceasing of visual post mortem inspection and (ii) more intensive incorporation of Food Chain Information. The scientific analysis is organised and presented in qualitative and quantitative parts of the AHAW Annex. Some opportunities for

AHAW are presented, based on the potential development of proposed changes in meat inspection addressing main public health hazards.

As consequences of omission of visual *post-mortem* inspection could be drawn:

- There is a potential for carcasses with pathology, currently condemned during visual post-mortem inspection, to enter the food chain, unless a system of meat quality assurance of carcasses is introduced at a later stage of processing.
- Current opportunities for data collection during visual *post-mortem* inspection may be lost, with the concomitant loss in information about the occurrence of relevant endemic poultry diseases and other welfare conditions.
- During detailed inspection of a representative subset of birds at post-mortem, it is recommended that selection of batches is risk-based, linked to relevant epidemiological criteria and food chain information, with sampling of birds within batches being conducted randomly, to provide a representative picture of the general health status of the batch.

According to the Food Chain Information would be important to specify that:

- As required under Council Regulations 853/2004 & 854/2004, meat inspection must be based on a risk assessment conducted on the entire food chain, with meat inspections being provided with relevant FCI about the flock to be slaughtered.
- As yet, only a limited number of epidemiological studies have been conducted in Europe to evaluate the value of FCI in the context of surveillance and monitoring for poultry health and welfare.
- There are gaps in knowledge about the utility of FCI in risk-based meat inspection. It is not yet possible to accurately predict condemnation rates in a given flock based on FCI. However, some risk factors for condemnation have been identified, and flocks with low or high risk of condemnation can be distinguished.
- More research is needed on the application of FCI for poultry health and welfare surveillance and monitoring, including FCI that are most relevant for this purpose. Studies should investigate a range of poultry health and welfare outcomes, in addition to condemnation.
- The implementation of the FCI concept offers practical opportunities towards the implementation of detailed inspection of a representative subset of birds at post-mortem. Systems to record FCI for public health could be modified or extended to also incorporate FCI relevant to poultry health and welfare.

The quantitative analysis was performed by the working group with a technical support in line with EFSA-Q-2011-00403 as further development and simplification of the model delivered in the frame of outsourced work (CFT/EFSA/AHAW/2010/01). Some key points may be identified:

- Meat inspection, as currently practiced, is not equally effective in detecting different diseases/conditions of poultry.
- The batch-level sensitivity is very dependent on the assumed design prevalence and the number of birds examined per batch. Batch-level detection probability increases with increased number of birds examined.
- An increase in sample size (that is, the number of birds sampled for more intensive meat inspection), as could occur with increased use of food chain information, will result in a higher sensitivity of meat inspection (for a given design prevalence) or the ability to detect lower levels of disease (at a given batch-level sensitivity).

### **7.3. Comments on the summary report on zoonoses**

**The mandate:** The mandate was prepared by the BIOMO Unit and requests the AHAW Panel to review the EU summary report on zoonoses. The review should address non-food-borne zoonoses (e.g. brucellosis, echinococcosis, rabies, tuberculosis). The AHAW panel is asked to:

1. review the European Union Summary Report on trends and sources zoonoses, zoonotic agents and food-borne outbreaks in 2009. This review should in particular focus on data related to bovine tuberculosis, *Echinococcus*, Q fever, brucellosis, and non-food-borne zoonoses including the current analyses of the available data;
2. evaluate the appropriateness of the data collected at EU level;
3. consider what data are needed at EU level to provide an accurate picture of the epidemiological situation in the EU and the Member States;
4. assess if the analyses methods used in the report are appropriate;
5. consider if collection of sampled based data for the report's aim instead of aggregated data would improve the quality and analyses of data at EU level;
6. consider if the data collection should be extended to additional zoonoses, or zoonotic agents, such as vector-borne zoonoses;
7. propose any improvements to the data collection, the presentation of the data and their analyses, as appropriate.

### **7.4. Request for a scientific opinion on the use of a gamma interferon test for the diagnosis of bovine tuberculosis (bTB)**

**The mandate:** Tuberculin skin test is currently the only available *in vivo* diagnostic test for bTB. While it provides a relative accurate and fast diagnosis of bTB (at a herd level), it has certain limitations when used on individual animals. Since 2002 the concurrent use of the IFN test as an ancillary test to the tuberculin skin test is regulated in Annex B (3) to Council Directive 64/432/EEC on animal health problems affecting intra-Community trade in bovine animals and swine in order to detect the maximum number of infected animals in a herd or

a region. Experience has been gained in the EU and elsewhere on the performance of the IFN test. The AHAW Panel is requested to issue a scientific opinion on the suitability of the IFN test as a prescribed test to be included as an alternative to the tuberculin skin test for granting and retaining officially bTB free herd status contemplated in the annex A to Directive 64/432/EEC and intra-Union trade in bovine animals.

**The approach:** It was clarified that the use of gamma interferon tests for other purposes such as control of disease by identification and culling of infected animals are not under the scope of the mandate. Furthermore gamma interferon and other tests should be evaluated for inclusion as single tests, not when in combination with other tests. Furthermore the assessment should aim at demonstrating the equivalency or superior diagnostic sensitivity of the tests when compared with the official test (skin test). The WG will concentrate in what is defined by the OIE as stage 2 of diagnostic test validation (estimation of diagnostic sensitivity and specificity), the approach if using a gold standard method or a latent class model will depend on the available data. The data sources to be used are: i) scientific literature, EU reference laboratory studies, MS and other stake holders data. A public call for data will be launched in March. The main difficulty is the large variation on gamma interferon testing protocols and antigen combinations currently in use. A AHAW network meeting was organised on the 21/2/2012 where the use of tuberculin tests in various MS was discussed. The meeting report will be used as a source of data for this opinion

A. Stegemann is the chair of the working group formed to prepare this opinion. The deadline of this mandate is 1 July 2012. The opinion will be submitted for discussion with the Panel in May and for adoption in June 2012.

#### **7.5. Request for a scientific opinion on animal health risk mitigation treatments as regards imports of animal casings**

Animal casings are imported into the European Union from a variety of third countries with different animal health status *inter alia* for use in the production of meat products like sausages. It is requested to assess whether the NaCl treatment has been refined in recent years as regards temperature and/or duration of treatment in a way that would lead to an increased level of safety as regards animal pathogens. It is also requested to assess whether alternative treatments have been developed that give equivalent or better results in the inactivation of pathogens possibly present in casings derived from animals of the bovine, ovine, caprine, porcine and equine species, taking into account scientific developments and technological progress. Finally, the request includes to assess whether the modified phosphate salt treatment, as described by the OIE Terrestrial Code in 2011, can be considered as an effective and reliable alternative to the standard NaCl treatment so as to provide at least equivalent animal health guarantees as regards the elimination of animal health risks posed by pathogens other than FMDV possibly present in casings derived from animals (taking into account the effects of both the temperature and the duration of treatment).

The approach: In this mandate the AHAW working group is focused on scientific analyses of information of treatments of casings against pathogens causing animal diseases in line with the requested mandate rather than a thorough risk assessment on the risk of introduction in the EU. Particular attention is going to be paid on viruses considered to present risk for the EU according to the legislation. A critical review of the literature obtained by a broad scope search and provided the hearting experts was used to extract relevant information. The work flow follows logic consequences in the analyses (i) defining most risky pathogens for the EU, (ii) describing some biological characteristic with implications on potential survival of the pathogens (iii) analysing the practices in production of casings (iv) analysing available treatments. The basic biological features of the pathogens are investigated in well known/recognised sources (scientific books, OIE manual and etc.). Specific outcome of various treatments are going to be based on the information of published literature. Differentiation is made on studies on casings from experimentally infected animals, in-vitro experiments. Some assumptions are made and indicated when information for characteristics of a pathogen or options for treatments can be extrapolated to another cause of infection or method in use. Various treatments would be presented in more structured way (e.g. table).

The draft opinion is foreseen to be presented for discussion at the AHAW Plenary in May 2012 and submitted for potential adoption in June 2012. Mariano Domingo accepted to chair the working group to be formed to prepare this opinion. The deadline is 30 June 2012.

## 7.6. Use of animal based measures to assess the welfare of broilers

**The mandate:** The mandate is the third of the series on animal based measures. The deadline is end of June 2012.

The request is to 1) identify how animal-based measures could be used to ensure the fulfilment of the recommendations of EFSA scientific opinions on the welfare of broilers 2) identify how the assessment protocols suggested by the Welfare Quality® project cover the main hazards identified in EFSA scientific opinions (and vice-versa); 3) identify which relevant animal welfare issues cannot be assessed using animal-based measures for broilers and what kind of alternative solutions are available to improve the situation; and 4) list main factors in the various husbandry systems which have been scientifically proven to have negative effects on the welfare of broilers and to what extent these negative effects can be or not prevented through management.

A preparatory work has been outsourced. The objectives were:

- systematically review the relevant scientific literature from 2000 for new available scientific evidence on the welfare of broilers
- propose possible amendments to the conclusions and recommendations of the SCAHAW scientific opinion
- identify hazards for broiler welfare

**The approach:** The working group drafted a table responding to TOR1, listing animal-based measures that could be used to ensure the fulfilment of the recommendations of the EFSA scientific opinions on the welfare of broilers. For each animal based measure (proposed by WQ), two separate scores will be assigned; one score for sensitivity (probability that the animal-based measure detects a problem, given that the animal is suffering from the adverse effect) and one for specificity (probability that the animal based measure does NOT detect a problem, given the animal is NOT suffering from the adverse effect) of the animal based measure in relation to the adverse effect (0-4). Another table was developed for addressing TOR2, based on the main factors (hazards) in the EFSA opinion. The hazards will be cross-linked to the animal-based measures proposed by the Welfare Quality protocol. The methodology is supposed to identify the animal-based measures which cover the main hazards identified in EFSA scientific opinions (and vice-versa). In order to address TOR3, gap identification will be based on TOR 1 and TOR 2. To address TOR4, the working group decided to separate, and give different scores (0 not possible-5 very good), to hazards (that can be prevented through short term management BETWEEN FLOCKS or WITHIN a FLOCK) and adverse effects (assuming presence of hazard).

## 7.7. Statement on the use of animal based measures to assess the welfare of animals

**The mandate:** The statement presents the approach of earlier EFSA Scientific Opinions on animal welfare and the approach of research on welfare assessment, such as the EU-funded Welfare Quality project, since these form the background to the series of opinions on the use of animal-based measures to assess welfare. It highlights differences in the risk assessment terminology used in those opinions and the welfare assessment terminology used by animal welfare scientists. It builds upon the recent work in EFSA to develop guidelines for risk assessment in animal welfare and so establishes a common framework for specific and detailed EFSA opinions on welfare assessment for dairy cows, pigs, broilers and other species. (Self task, deadline June2012)

**The approach:** The statement contains Section 1 and 3 of the dairy cow draft scientific opinion (Rev. 6.0, 20 July 2011) related to the concepts and general use of the animal-based measures and on the development of tools to monitor animal welfare, respectively, left out from the final scientific opinion.

Concepts and general parts that could be relevant for different species have been expanded with some differences:

- not only refer to Welfare Quality project. More general discussion of welfare and welfare assessment
- increased discussion on intensity, duration and magnitude
- expanded section on “Essential attributes of animal-based measures” with analogies to OIE diagnostic test validation guideline
- development of tools to monitor animal welfare –links between factors and animal-based measures

- quantifying the strengths of the links, of predictive and classification capacity
- risk-based surveillance (monitoring plus corrective action/control)
- advice for future opinions on use of animal-based measures in welfare assessment  
Identify the animal-based measures to be placed in the 'toolbox' for this species
- collect the data in a way that it contributes to the establishment of a database(s) for future quantitative risk assessment of animal welfare (Take the ideas of health monitoring and use it for welfare monitoring)