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The role of EFSA in assessing and promoting animal health and welfare

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ABSTRACT

This paper describes the overall achievements of the Animal Health and Welfare (AHAW) Panel of EFSA and its support unit since 2003. The AHAW Panel deals with animal health and animal welfare issues, primarily related to food-producing animals, at the human–animal–environment interface. Scientific opinions adopted by the AHAW Panel are comprehensive scientific reviews and risk assessments and provide the scientific grounds for the identification of control options, most of them being reflected in European Union legislation on animal health and welfare. Between 2004 and 2012, the AHAW Panel delivered 47 scientific opinions related to animal health and 38 scientific opinions on animal welfare on a wide variety of issues. The welfare of animals is a matter of much public concern and has an overall impact on the condition of the animals, with consequences for productivity, disease and food safety. A major achievement of the AHAW Panel has been to establish a unique multidisciplinary capacity, combining expertise in addressing animal health and welfare issues. The AHAW Panel has also demonstrated its capacity to respond rapidly to urgent requests, thus becoming a prominent partner of risk managers in response to crises. Over time, the AHAW Panel has become internationally recognised as a leader in risk assessment in the field of animal health and welfare, based on EFSA core values of scientific excellence, independence and transparency. The development of robust methodological frameworks for the assessment of risks related to animal health and welfare is a continuing process for the AHAW Panel. Over the past ten years, EFSA has achieved greater participation from the scientific community, stakeholders and interested parties, and fostered cooperation with relevant organisations in the EU Member States in the area of animal health and welfare. The AHAW Panel has demonstrated that evaluating health and welfare and assessing risk in animal populations serves to protect public health, the environment and the economic benefit we derive from animals.

KEY WORDS

Animal health, animal welfare, risk assessment

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INTRODUCTION

In the Risk Assessment and Scientific Assistance (RASA) Directorate, the Panel on Animal Health and Welfare (AHAW Panel) provides scientific advice on all aspects of animal health and welfare, including those that have implications for human health, in order to support the science-based development of animal health and welfare standards within the European Union. It epitomises the EU approach to food safety: "from the farm to the fork". The work of the AHAW Panel is relevant to food safety but also to food security.

In recent years, there has been increased public concern about the sustainability of systems such as those for producing human food; concepts of food quality have been refined. Human health but also animal health and welfare are among the components of sustainable systems and good-quality food. Safeguarding animal health is a public good that benefits all segments of society; animal welfare is another dimension of this public good. The core activity of the AHAW Panel and its support unit is to assess all aspects of health and welfare pertaining to animal production systems and practices that are applied in the EU, as well as conditions resulting from animals interacting with wildlife and the risks arising at the human–animal–environment interface.

Ethical, socioeconomic, cultural and religious aspects are outside the remit of the AHAW Panel.

Since 2003 the AHAW Panel has been actively engaged in providing independent scientific advice to EU and Member States decision makers (i.e. risk managers) and consumers on questions relating to animal health and welfare, primarily in food-producing animals. An integral part of this work has been the development of technical guidance documents and methodological approaches in order to ensure that EFSA's approaches to risk assessment related to animal health and welfare are transparent.

This paper describes the main achievements of the AHAW Panel and its support unit since 2003.

SCIENTIFIC ADVICE ON QUESTIONS RELATED TO ANIMAL HEALTH AND WELFARE

Between 2004 and 2012, the AHAW Panel has delivered more than 47 scientific opinions related to animal health and 38 scientific opinions on animal welfare, providing scientific advice and technical support to risk managers on a wide variety of issues. The division between animal health and animal welfare is, however, arbitrary as almost all are relevant to animal welfare and most are relevant to animal health. The number of scientific opinions adopted by the AHAW Panel, as well as statements, guidance, external scientific reports and technical reports, between 2004 and 2012 is presented in Table 1.

The type of questions received by the AHAW Panel generally relate to: (i) reviewing the scientific basis of existing EU legislation (e.g. Council Directives 91/629/EEC and 97/2/EC on the welfare of calves (EFSA, 2006a), Commission Regulation (EC) No 1266/2007 on bluetongue (EFSA Panel on Animal Health and Welfare (AHAW), 2011a), Council Directive 95/29/EC and Council Regulation (EC) No 411/98 and Council Regulation (EC) No 1/2005 on animal welfare during transport (EFSA, 2004a,b; EFSA Panel on Animal Health and Welfare (AHAW), 2011b)); (ii) considering possible new legislation (e.g. risks of importing wild birds other than poultry into the EU (EFSA, 2006b), and the welfare of dairy cows (EFSA, 2009a)); (iii) performing post-event scientific assessments (e.g. Q-fever (EFSA Panel on Animal Health and Welfare (AHAW), 2010a), novel swine influenza (EFSA Panel on Animal Health and Welfare (AHAW), 2010b and 2011c), foot and mouth disease (EFSA Panel on Animal Health and Welfare (AHAW), 2012a)); (iv) addressing new, arising concerns (e.g. oyster mortality (EFSA Panel on Animal Health and Welfare (AHAW), 2010c), epizootic ulcerative syndrome (EFSA Panel on Animal Health and Welfare (AHAW), 2011d)); and (v) contributing to the implementation of the EU Animal Health Strategy 2007–2013 (EC, 2007, e.g. disease categorisation, risk factors and surveillance) and the Animal Welfare Strategy 2012–2015 (EC, 2012), e.g. outcome-based indicators (EFSA Panel on Animal Health and Welfare (AHAW), 2012a,b).

Table 1: Scientific outputs by the AHAW Panel between 2004 and 2012, as well as external scientific reports with breakdown into questions related to animal health and welfare

	AHAW Scientific Opinions[a]									
	Opinions[a]		Statements[a]		Guidances[a]		External scientific reports[b]		Technical reports[b]	
	AH	AW	AH	AW	AH	AW	AH	AW	AH	AW
2004	1	4								
2005	3	4								
2006	6	2	1							
2007	12	4						1	2	
2008	6	5								
2009	4	13		1	1		8	1	1	
2010	7	2	1				2	3		2
2011	6	1					1	3	1	
2012[c]	2	3		1		1	3	1	4	1

[a] Available online: www.efsa.europa.eu/efsajournal
[b] Available online: www.efsa.europa.eu/publications
[c] Before June 2012.

AH, animal health; AW, animal welfare.

All the opinions listed above illustrate the impact of scientific assessment by the AHAW Panel on European legislation. For example, Council Regulation (EC) No 1/2005[3] on the protection of animals during transport is essentially based on the conclusions and recommendations of the 2004 EFSA scientific opinion on the welfare of animals during transport. This opinion has recently been updated (EFSA Panel on Animal Health and Welfare (AHAW), 2011b) and has contributed to a report from the European Commission to the European Parliament and the Council proposing additional management options for the enforcement of Regulation (EC) No 1/2005. Similarly, EFSA opinions on the welfare aspects of the main systems of stunning and killing (EFSA, 2004a) led to Council Regulation (EC) No 1099/2009[4] on the protection of animals at the time of killing. Further to this, stunning and killing of fish has been addressed by seven species-specific scientific opinions adopted in 2009, which are expected to support the development of legislative measures for the protection of fish at the time of killing (EFSA, 2009b–h).

Over the past ten years, requests received from the European Commission have evolved from very broad questions on various issues (probably because of the need to establish the broad context for performing risk assessment within the area of animal health and animal welfare) to more focused and specific questions (e.g. the electrical requirements for waterbath stunning (EFSA Panel on Animal Health and Welfare (AHAW), 2012c)).

Frequently, questions that initially appear to be animal health specific also cover aspects related to animal welfare. An example of this is the recent publication of the report on the impact of the Schmallenberg virus (EFSA Panel on Animal Health and Welfare (AHAW), 2012b). Similarly, animal welfare questions also cover aspects related to animal health such as, for example, the scientific opinion on the impact on welfare of genetic selection in commercial broilers (EFSA Panel on Animal Health and Welfare (AHAW), 2010d). The combining of animal health and welfare expertise into a single panel gives EFSA a unique capacity to address such complex, interactive issues.

[3] Council Regulation (EC) No 1/2005 of 22 December 2004 on the protection of animals during transport and related operations and amending Directives 64/432/EEC and 93/119/EC and Regulation (EC) No 1255/97. OJ L 3, 5.1.2005, pp. 1–44.
[4] Council Regulation (EC) No 1099/2009 of 24 September 2009 on the protection of animals at the time of killing. OJ L 303, 18.11.2009, pp. 1–30.

While most questions have concerned animals used for food production, the AHAW Panel has also adopted scientific opinions on laboratory animals (e.g. the welfare of experimental animals (EFSA, 2005a)) and wild animals (e.g. the welfare aspects of killing and skinning seals (EFSA, 2007a)).

Three successive panels (2003–2006,[5] 2006–2009[6] and 2009–2012[7]) have contributed to this production of scientific outputs. Members of the Panel come from different backgrounds, expertise and experience to address the spectrum of questions on animal health and welfare. One-third of the members of the AHAW Panel are experts in animal health, mainly infectious diseases, one-third are experts in animal welfare, including behaviour, and one-third are experts in methodologies, i.e. risk assessment, modelling and epidemiology.

The AHAW Panel also benefits greatly from access to a wide network of world-class experts and cooperation with other national agencies and international organisations operating in the field of animal health and animal welfare. Every year, more than a hundred experts are invited to participate in working groups of the Panel

Often, the multifaceted questions addressed by the AHAW Panel call for cooperation with other EFSA panels and units and other EU agencies such as the European Medicines Agency (EMA) and the European Centre for Disease Prevention and Control (ECDC). Many examples illustrate this interagency cooperation (e.g. the H1N1 influenza virus, Q fever, arthropod-borne diseases). The World Organisation for Animal Health (OIE) and the Food and Agriculture Organization of the United Nations (FAO) are two international organisations that are relevant for the AHAW Panel, and their representatives are regular observers at plenary meetings of the AHAW Panel.

The scientific activities within animal health and welfare are further supported by the EFSA Scientific Network for Risk Assessment in Animal Health and Welfare (hereafter the AHAW Network). The terms of reference of the AHAW Network are to (i) facilitate the harmonisation of animal health and welfare assessment practices and methodologies; (ii) enhance the exchange of information and data between EFSA and Member States; and (iii) achieve synergies in animal health and welfare risk assessment activities. Organisations from the 27 EU Member States participate, while Switzerland, Iceland and Norway are also part of the AHAW Network as observers.

The AHAW Network held its first meeting in November 2010 and since then several technical meetings and workshops were held for the members of the Network. These included the use of models in risk assessment for animal health, the implementation of risk assessment in animal welfare, and the data needs and specification and sharing and accessing of data. The Network has also provided opportunities to conduct retrospective comparative analyses of EFSA scientific opinions and those of national agencies on specific issues (e.g. echinococcosis, oyster mortality, Q fever). The exchange of information pertaining to ongoing activities within the Network has fostered cooperation between members of the Network on topics addressed at national and EU levels (e.g. bovine tuberculosis, Schmallenberg virus).

In delivering scientific opinions and providing independent scientific advice to risk managers on questions related to animal health and welfare, the AHAW Panel has also promoted scientific

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communication, the exchange of information and data, networking to avoid duplication of effort and improved efficiency.

THE METHODOLOGY OF RISK ASSESSMENT IN ANIMAL HEALTH AND WELFARE

The quality of risk assessment depends on the appropriate formulation of the questions, a clear understanding of their background, the best use of scientific data and expert opinion, and the application of advanced risk assessment methodology to address the questions posed.

When looking at all the scientific opinions adopted by the AHAW Panel over the past ten years, it can be seen that the methodologies have evolved in two directions. One of these has already been mentioned above: initially broad requests dealing with many concepts for various species lately becoming more targeted in terms of their questions and objectives and therefore enabling more in-depth analysis. The second direction taken through the scientific opinions of the AHAW Panel is the shift from purely qualitative to more quantitative risk assessment.

In 2010, the AHAW Panel developed a guidance document on good practice in conducting scientific assessments of animal health using modelling (EFSA Panel on Animal Health and Welfare (AHAW), 2009). The guidance takes account of previous opinions on animal health, two-thirds of which used some kind of modelling and on average every third opinion was supported by a quantitative model. These models range from simple to complex and apply a combination of scientific, economic, and socioeconomic data. The guidance document provides a detailed workflow enabling modelling to be integrated transparently and consistently in risk assessment. The workflow is divided into several phases combining EFSA standard operating procedures with the modelling process. The phasing approach has been gradually implemented by the AHAW Panel.

Following the recommendations of the AHAW Panel, a dynamic wiki-like web-based glossary for the terminology used in modelling was developed. This glossary, maintained and continuously reviewed by EFSA experts, supports and facilitates the consistent use of terminology in the wide range of outputs on animal health or welfare.

The AHAW Panel is also developing risk assessment methodologies for animal welfare. Building on its unique experience, the AHAW Panel has adopted the guidance on risk assessment for animal welfare (EFSA Panel on Animal Health and Welfare (AHAW), 2012d). This document provides methodological guidance to assess risks in animal welfare, considering the various husbandry systems and management procedures and the different animal welfare issues. The terminology for the risk assessment of animal welfare is described. The major components of problem formulation are the description of the exposure scenario, the target population and the conceptual model, linking the relevant factors of concern in animal welfare. The formal risk assessment consists of three components: exposure assessment, consequence characterisation and risk characterisation. The systematic evaluation of the various aspects and components of the assessment procedure aims to ensure its consistency. All assumptions used in problem formulation and risk assessment need to be clear. This also applies to the assessment of uncertainty and variability in the various steps of the risk assessment. The choice of qualitative, semi-qualitative or quantitative approaches is based on the purpose or the type of questions to be answered and data and resource availability for a specific risk assessment. Quantitative data should be used whenever possible. Positive effects on welfare can be handled within the framework of risk assessment if the analysis considers factors having both positive and negative effects on animal welfare. The guidance also provides details of the main components of risk assessment documentation. This guidance document puts EFSA at the forefront of the development of risk assessment methodology for animal welfare.

It is anticipated that more guidance documents will be issued in the near future. For example, the AHAW Panel has gained experience in assessing the role of wildlife in the maintenance of infectious diseases (e.g. African swine fever (EFSA Panel on Animal Health and Welfare (AHAW), 2010e), foot and mouth disease (EFSA Panel on Animal Health and Welfare (AHAW), 2012a). This is a recurrent

need for risk managers (e.g. bovine tuberculosis), although it is likely to be highly dependent on local factors. The AHAW Panel can provide valuable technical guidance on how to perform such an assessment. Similarly, the increased need for data, data specification and data collection will require technical guidance from the Panel.

Considering the broad diversity of issues addressed by the AHAW Panel, data collection constitutes one of the most important and time-consuming activities of the AHAW Unit. Literature searches are usually the primary activity. The AHAW Panel implements the EFSA guidance on systematic literature reviews. Such literature reviews allow for a transparent and reproducible search of the available information and harmonised data collection. The AHAW unit has outsourced systematic literature reviews (e.g. Lefebvre et al., 2010) and conducted some in-house (e.g. bluetongue (EFSA Panel on Animal Health and Welfare (AHAW), 2011e)). Data have also been collected via public calls for data (e.g. call for data on the harvesting of feathers (EFSA Panel on Animal Health and Welfare (AHAW), 2010f) and consultation with Member States or stakeholders and interested parties. The European Commission and Member States have been involved in data collection both through the network of EU reference laboratories,[8] established by the European Commission (e.g. oyster mortality (EFSA Panel on Animal Health and Welfare (AHAW), 2010c), and directly through requests to the Scientific Committee of the Food Chain on Animal Health[9] (e.g. data on Q-fever (EFSA Panel on Animal Health and Welfare (AHAW), 2010a) or the impact of the Schmallenberg virus (EFSA Panel on Animal Health and Welfare (AHAW), 2012b)).

Most of the outputs of the AHAW Panel, however, mention gaps in data and poor-quality data as a major source of uncertainty. As the development of harmonised terminologies and standards for data collection can improve the data quality in support of the risk assessment process, a project was granted (under the provisions of Article 36 of EFSA's Founding Regulation (EC) No 178/2002[10]) to (i) develop a methodology for data collection including the definition of metadata standards for outcome values to support data validation and quality assessment; and (ii) establish a methodological framework for the use of data in a scientific assessment to address questions relevant to animal diseases. The outcome of this scientific cooperation and the ongoing self-mandate to review the Community Summary Report (EFSA, 2009i; EFSA Panel on Animal Health and Welfare (AHAW), 2011f) will contribute to addressing the risk assessment needs for data in the field of animal health.

For animal welfare, the AHAW Panel has undertaken work on animal-based measures for the welfare of animals (EFSA Panel on Animal Health and Welfare (AHAW), 2012e,f). This aspect of the AHAW Panel's work reflects a shift in the way in which scientists and policy makers in Europe are considering animal welfare assessment. This is a move away from a system that measures aspects of the environment the animal lives in towards one that measures the way in which the animal itself responds to this environment. It will pave the way for the collection of data from Member States and future quantitative risk and benefit assessment. The AHAW Panel has also issued a statement (EFSA Panel on Animal Health and Welfare (AHAW), 2012g) that clarifies some common issues of terminology, provides for the integration of concepts, and presents some essential characteristics of animal-based measures to ensure that they are 'fit for purpose'. It highlights the fact that more information is needed about the direction and strength of the various links between input factors and animal-based measures of welfare outcomes. The statement also highlights the importance of the systematic collection of standardised field data on animal-based measures and their subsequent availability in well-defined databases. Targeted analysis of such data will help in selecting the most appropriate measure, or combination of measures, according to the specific purpose of the welfare assessment. The development, validation and practical implementation of welfare indicators will offer new opportunities to collect epidemiological data and information on the welfare status of food-producing animals in Europe.

[8] Available from http://ec.europa.eu/food/animal/diseases/laboratories/index_en.htm

[9] Available from http://ec.europa.eu/food/committees/regulatory/scfcah/animal_health/index_en.htm

[10] 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. OJ L 31, 1.2.2002, pp. 1–24.

CONCLUSIONS

The work of the AHAW Panel has changed greatly over the past ten years, adapting to new scientific knowledge and methodologies. The AHAW Panel has also established a constructive and interactive dialogue with decision makers, while maintaining the formal scientific independence foreseen in EFSA's Founding Regulation (EC) No 178/2002. It has achieved greater participation of the scientific community, stakeholders and interested parties and fostered cooperation with relevant organisations in the EU Member States. This is a major achievement because the quality of risk assessments depends on the appropriate formulation of questions and terms of reference, a clear understanding of their background, the best use of scientific data and expert opinion, and the application of advanced risk assessment methodology to address the question posed.

The development of robust methodological frameworks for the assessment of risks related to animal health and welfare is a major achievement of the AHAW Panel. However, it remains one of the continuing, long-term tasks of the Panel to improve the methodological approach to risk assessment applied to animal welfare. In particular, the questions of repeated exposure to, and the interaction of, welfare hazards need to be addressed.

Over the past ten years, the AHAW Panel has assumed an internationally recognised leading role as risk assessor in the field of animal health and welfare, based on EFSA's core values of scientific excellence, independence and transparency.

The majority of human infectious diseases have originated through the cross-species transmission of pathogens from animals to humans (Wolfe et al., 2007). About 70 % of human diseases have evolved from those of animals (Schneider et al., 2011). The scientific opinions from the AHAW Panel have demonstrated that assessing the risks to the health and welfare of animal populations may also serve to protect public health, the environment and the economic benefit we derive from those animal populations. In particular, what is meant by animal welfare is not just restricted to the protection and well-being of animals. The welfare of animals has an overall impact on the condition of the animals, including possible implications for animal health and food safety. These aspects have been considered in many of EFSA's scientific opinions on animal welfare. For example, tail biting in pigs is a major welfare issue and also a risk factor for increased frequency of abscesses and infections in carcasses (EFSA, 2007b). On the other hand, the risk of contamination with *Salmonella enteritidis* might be higher when eggs are produced in non-cage-based systems because of the greater exposure of laying hens and their eggs to environmental contamination (EFSA, 2005b).

Within EFSA, the AHAW Panel deals with animal health and welfare questions, primarily related to food-producing animals, at the human–animal–environment interface. Scientific opinions adopted by the AHAW Panel have shown that this interface is not only relevant for foodborne zoonoses and biological hazards in food. Non-foodborne zoonoses, including arthropod-borne diseases, have become more prominent at the human–animal interface. It is important to note that the involvement of EFSA and the AHAW Panel in these questions has been achieved by developing good relationships with relevant EU partners such as the ECDC. The AHAW Panel has also demonstrated its capacity to respond rapidly to urgent requests, thus becoming a prominent partner of decision makers in response to crises (e.g. Q fever, Schmallenberg virus, influenza virus).

Overall, and not least, the major achievement of the AHAW Panel has been the establishment of a unique multidisciplinary capacity, blending expertise in addressing animal health and welfare issues.

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