



Role of the European Food Safety Authority (EFSA) in providing scientific advice on the welfare of food producing animals

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ABSTRACT

The survey describes the work of the Animal Health and Welfare (AHAW) Panel of the European Food Safety Authority (EFSA) in the provision of scientific advice on the welfare of food producing animals including animal health and food safety aspects, where relevant, and on the impact of these scientific assessments on the EU regulatory framework. EFSA was created in 2002 with the mission to provide advice and scientific and technical support for the Community legislation and policies in all fields which have a direct or indirect impact on food and feed safety, plant health, environment and animal health and animal welfare. When providing objective and independent science-based advice, the risk assessment approach should be followed, whenever possible.

The AHAW Panel of EFSA provides specific advices on risk factors related to animal diseases and welfare, mainly of food producing animals, including fish. According to EFSA's remit, ethical, socio-economic, cultural and religious aspects are outside the scope of the EFSA's assessments. Since 2004, the Animal Health and Welfare Panel of EFSA adopted a total of 21 scientific opinions on animal welfare. Animal diseases and food safety aspects have also been taken into account, where relevant. Animal welfare aspects have been considered in some scientific opinions on animal diseases (e.g. AI, FMD). The AHAW Panel is currently working on five scientific opinions on the welfare of dairy cows and on the welfare aspects of the stunning and killing of farmed fish for eight fish species (salmon, trout, carp, eel, tuna, sea bass, sea bream and turbot). The possible interactions and implications for food safety and animal disease have been considered, when relevant, in most of the AW scientific opinions, involving other areas of expertise in EFSA, like Biohazards, Contaminants and Plant Health. The final aim of EFSA's scientific assessments on animal welfare is to support animal welfare EU legislation on the basis of the available scientific evidence. Many examples illustrate how EFSA's scientific opinions are taken into consideration when legislative measures are proposed by the European Commission. In order to evaluate the overall impact of animal welfare, factors with possible incidence on animal diseases and food safety should also be considered. The evaluation of the interactions between animal welfare, animal disease and food safety could help the development of control and monitoring plans at farm level.

RIASSUNTO

RUOLO DELL'AUTORITÀ EUROPEA DI SICUREZZA ALIMENTARE (EFSA) NEL FORNIRE PARERI SCIENTIFICI SU VARI ASPETTI DEL BENESSERE DEGLI ANIMALI DA REDDITO.

La rassegna descrive il lavoro svolto dal comitato scientifico per la salute e il benessere degli animali (AHAW) dell'Autorità Europea di Sicurezza Alimentare (EFSA) nel fornire pareri scientifici su vari aspetti di

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benessere degli animali da reddito, compresi gli aspetti di sanità animale e di sicurezza alimentare (ove pertinenti) e sull'impatto di tali valutazioni scientifiche sulla legislazione UE. Nel fornire consulenza tecnica e scientifica in materia di benessere animale, l'approccio di valutazione del rischio dovrebbe essere seguito qualvolta possibile. L'EFSA è stata creata nel 2002, con la missione di fornire pareri e supporto scientifico e tecnico per la legislazione e le politiche Comunitarie in tutti i campi che hanno un impatto diretto o indiretto sulla sicurezza degli alimenti e dei mangimi, sulla fitopatologia e sulla salute e il benessere degli animali. Il Comitato Scientifico AHAW dell'EFSA fornisce pareri specifici sui fattori di rischio riguardanti le malattie e il benessere degli animali da reddito, principalmente quelli destinati alla produzione di alimenti per l'uomo, compresi i pesci. Secondo lo statuto regolatore dall'EFSA, gli aspetti etici, socio-economici, culturali e religiosi sono da considerare al di fuori del suo incarico. Dal 2004, il comitato scientifico AHAW dell'EFSA ha adottato complessivamente 21 pareri scientifici sul benessere animale. Quando attinenti, gli aspetti di salute animale e di sicurezza alimentare sono stati presi in considerazione. Aspetti legati al benessere animale sono anche stati presi in considerazione in alcuni pareri scientifici sulla salute degli animali (i.e. Influenza Aviaria, Afta Epizootica, etc). Il comitato scientifico AHAW attualmente sta lavorando a cinque pareri scientifici sul benessere delle vacche da latte nonché sugli aspetti di benessere relativi ai metodi di stordimento e macellazione dei pesci d'allevamento in 8 specie ittiche (salmone, trota, carpa, anguilla, tonno, branzino, orata e rombo). Le interazioni e le possibili implicazioni in termini di sanità animale e sicurezza alimentare sono state considerate nella maggior parte dei pareri scientifici riguardanti il benessere animale, coinvolgendo altri campi di specializzazione presenti nell'EFSA, come i pericoli biologici (Biohazards), gli agenti inquinanti la catena alimentare e la fitopatologia. Lo scopo finale delle valutazioni scientifiche sul benessere animale prodotte dall'EFSA è quello di sostenere i provvedimenti legislativi da parte della UE in materia di benessere animale sulla base dell'evidenza scientifica. Molti esempi mostrano come i pareri scientifici dell'EFSA siano stati presi in considerazione laddove la Commissione Europea ha proposto nuove misure legislative. L'impatto complessivo del benessere animale deve considerare fattori che abbiano una possibile incidenza sulle malattie animali e sulla sicurezza alimentare. La valutazione di tale impatto complessivo e delle interazioni tra benessere animale, malattie animali e sicurezza alimentare dovrebbe aiutare lo sviluppo di programmi di monitoraggio e controllo a livello aziendale.

Introduction

Following a series of food crisis in the late 1990s, the European Food Safety Authority (EFSA) was created in 2002, with the mission to provide advice and scientific and technical support for the Community legislation and policies in all fields which have a direct or indirect impact on food and feed safety, plant health, environment and animal health and animal welfare. EFSA shall also provide independent information on all matters within these fields and communicate on risks (EC, 2002).

EFSA can be requested by the different European Commission services, but also by the European Parliament, EU Members States or by EFSA itself as a self-mandate,

to provide a scientific assessment following, whenever possible, a risk assessment approach, in accordance to the sanitary and phytosanitary (SPS) agreement of the World Trade Organisation (WTO, 1995) which establishes that SPS measures should be based on a risk assessment approach taking into account all available scientific evidence.

When EFSA receives a mandate requesting to issue a Scientific Opinion, a working group is set up, composed by experts on the specific issue and a risk assessor in charge of defining the risk pathways and the risk assessment methodology. The working group, through different meetings, compiles in a document all available scientific data and information on the issue and a Scientific Opinion containing all conclusions and

recommendations from the compiled document is finally reviewed and adopted by a permanent Panel of experts. After that, and in agreement with EFSA's policy on transparency, all scientific documents issued are published on EFSA's web site (www.efsa.europa.eu).

Within the 10 Scientific Panels of EFSA, the Animal Health and Welfare (AHAW) Panel provides specific scientific advices on risk factors related to animal diseases and welfare, primarily of food producing animals, including fish. In the case of animal welfare, it is important to stress that, in agreement with Regulation 178/2002 (EC, 2002), ethical, socio-economic, cultural and religious aspects are outside the scope of the EFSA's remit. Only risk managers (European Commission) deal with legitimate and legal factors, including social, economic, traditional, ethical and environmental factors and the feasibility of controls.

The objective of this paper is to review the work done by the Animal Health and Welfare Panel of EFSA on the provision of scientific advice on the welfare aspects of food producing animals, the interaction between animal welfare, animal disease and food safety and the impact of these scientific assessments on the EU regulatory framework.

EFSA's Scientific Opinions on Animal Welfare (2004-2008)

The main role of EFSA on animal welfare is to provide assessments and address animal welfare issues from a scientific point of view, also defining animal welfare in relation to animal health. When providing objective and independent science-based advice, the risk assessment approach should be followed, whenever possible (EC, 2002; EFSA, 2007d; Müller-Graf *et al.*, 2008). In the case of experimental animals, EFSA adopted a pro-active animal welfare approach in the

Management Board document produced during its meeting of June 2004, saying that "...while recognizing that animal testing cannot be eliminated at present, EFSA should make every effort to stimulate and participate in the development of new food and feed assessment approaches that would minimize the use of experimental animals and would reduce, to the extent possible, the level of suffering of animals..." (EFSA, 2004a).

Since 2004 to December 2008, the Animal Health and Welfare Panel of EFSA has adopted a total of 21 Scientific Opinions on animal welfare, focused on pig welfare (5 SO), fish welfare (5 SO), stunning and killing of animals (3 SO), animal transport (2 SO), calves' welfare, import of wild birds, rabbits, laying hens, laboratory animals and the "Framework for EFSA AHAW Risk Assessments" (EFSA, 2007d). Also, animal welfare aspects were requested to be considered in the scientific opinions on animal diseases, such as, avian influenza (EFSA, 2005a), import of captive birds (EFSA, 2006a) and avian influenza vaccines (EFSA, 2007c). It is important to point out that the European Commission when committing an animal welfare mandate, requests to take into account, where relevant, animal disease and food safety aspects. Table 1, shows the animal welfare scientific opinions adopted since 2004 and highlights when animal disease aspects and food safety issues have been considered.

The AHAW Panel is currently working on five scientific opinions on the welfare aspects of Dairy Cows. Four of these scientific opinions will be based on four Risk Assessments of the impact of housing, nutrition and feeding, management and genetic selection on 1) leg and locomotion problems; 2) metabolic and reproductive problems; 3) udder problems and 4) behavioural, fear and pain problems in dairy cows. The fifth

Table 1. Animal Welfare Scientific Opinions adopted since 2004 by the AHAW Panel.

	Scientific opinions	Year	AD	FS
1	Transport	2004	X	
2	Stunning/killing of main species	2004	X	X
3	Castration of piglets	2004		X
4	Microclimate in transport	2004	X	
5	Laying hens	(publ. 2005)	X	X
6	Farmed domestic rabbits	2005	X	
7	Pig: space allowance/floor types	2005	X	X
8	Laboratory animals	2005		
9	Stunning/killing of minor species	2006		X
10	Import of wild birds	2006	X	
11	Calves welfare	2006	X	X
12	Pig welfare: Sows and boars	2007		X
13	Pig welfare: Fattening pigs	2007		X
14	Pig welfare: Tail Biting	2007		X
15	Stunning/killing methods of Seals	2007		
16	Framework for EFSA AHAW Risk Assessments	2007	X	
17	Fish welfare: Salmon	2008	X	X
18	Fish welfare: Trout	2008	X	X
19	Fish welfare: Carp	2008	X	X
20	Fish welfare: European eel	2008	X	X
21	Fish Welfare: Gilthead seabream/sea bass	2008	X	X

AD: animal disease; FS: food safety.

opinion will be an overall welfare assessment of the effects of farming systems on dairy cows' welfare and disease integrating the conclusions from the 4 risk assessments and the conclusions from the data compiled in a scientific report. Additional scientific opinions on welfare aspects of the stunning and killing of farmed fish, including 8 fish species (salmon, trout, carp, eel, tuna, sea bass, sea bream and turbot) are currently under development and are expected to be adopted during 2009.

Interactions among animal welfare, animal disease and food safety in EFSA's scientific opinions on animal welfare

Whenever relevant and needed, the possible interactions and implications for food safety and animal disease have been considered in most of the animal welfare scientific opinions, involving other areas of expertise in EFSA, like Biohazards, Contaminants, and Plant Health. Some examples of this interaction are illustrated (Table 2).

In the scientific opinion on welfare aspects of various systems of keeping laying hens (EFSA, 2004e) it was concluded that keeping laying hens in non-cages systems will improve their welfare. However, it was also concluded that the risk of contamination with *Salmonella* spp. might be higher when eggs are produced in some non-cage systems because of the greater exposure of layers and their eggs to environmental contamination.

In the scientific assessment related with the migratory birds and their possible role in the spread of highly pathogenic avian influenza (EFSA, 2006b), it was concluded that allowing chickens to open air access, and thus improving their welfare, may increase the risk of exposure to contagious diseases such as Avian Influenza (AI).

Several examples of the interactions between animal welfare and risk of disease can be also found on the scientific opinions on the welfare of pigs (EFSA, 2005b; 2007a, 2007b, 2007e). For instance in the scientific opinion about the effect of different space allowances and floor types in pigs it was concluded that floor type may have an influence on enzootic multifactorial diseases, including enteric and respiratory infections and that types of floor leading to bad urine drainage and to insufficient faeces removal increase the risk of infections, especially those leading to enteric disorders in pigs (EFSA, 2005b). The bedding material has been considered in each pig scientific opinion, concluding that using straw as bedding material might act as vehicle of diseases such as Foot and Mouth Disease (FMD) or Aujeszky's disease. As mentioned for poultry, keeping the pigs outdoors with possible contact with the wild fauna, mainly wild boars, is believed to be a source of Brucellosis in domestic pigs (EFSA, 2007a, 2007b, 2007e).

In relation to the interaction between animal welfare and food safety aspects, the use

of "penetrating captive bolt" stunning system has been recognised as one of the most appropriate systems in terms on animal welfare, when properly applied. However the potential dissemination of central nervous system emboli into edible tissues with consequent exposure of humans to BSE can not be excluded (EFSA, 2004c; 2006c).

Considering previous literature about the importance of the interaction between animal welfare, animal disease and food safety (EC, 2000; EC, 2007; Blokhuis *et al.*, 2008; Ribó *et al.*, 2008b), all above-mentioned aspects and the role of EFSA on defining animal welfare in relation to animal health, it could be stated that, for assessing the overall impact of animal welfare, it is important to also consider factors with possible incidence on animal diseases and food safety. Finally, the evaluation of this overall impact and interaction between animal welfare, animal disease and food safety should help the development of control and monitoring plans at farm level.

Impact of the EFSA scientific assessments on the EU policy on the welfare of animals

The final aim of the scientific assessments on animal welfare by EFSA, is to support animal welfare EU legislation based on scientific evidence. In this sense, there are many examples which illustrate how EFSA's scientific opinions are taken into consideration when legislative measures are proposed by the European Commission (EC, 2002; Blokhuis *et al.*, 2008; Ribó *et al.*, 2008a, b).

Council Regulation (EC) No 1/2005 (EC, 2005) on the protection of animals during transport amends previous EU legislation on Animal Welfare during transport and takes into account new available scientific evidence. Some of the measures laid down

Table 2. Example of interaction among animal welfare, animal health and food safety from EFSA Scientific opinions (adapted from Ribó *et al.*, 2008a; Blokhuis *et al.*, 2008).

Species (Sc. opinion)	Animal Welfare Issue	Impact on AD	Impact on FS
Cattle (2004d)	Related stress in transport	Shipping fever (<i>Pasteurella spp.</i> , BRSV, IBR, <i>E. Coli</i> and <i>Salmonella spp.</i>)	Meat contamination with <i>Salmonella</i>
All species (2004d)	Mixing animals at staging points	Spread of infectious diseases (e.g. <i>E. Coli</i> , <i>Salmonella</i>)	Meat contamination with <i>Salmonella</i>
Ruminants (2004b; 2006c)	Stunning method: Penetrative Captive bolt for stunning	Not applicable	Dissemination of contaminated nervous tissue into edible parts Risk of BSE/CJD
Laying hens (2004e)	Non-cage systems	Risk of egg contamination with <i>Salmonella (S. enteritidis)</i>	Egg contamination with <i>Salmonella</i>
Poultry (2005a, 2006a)	Outdoor systems	Highly Pathogenic AI (HPAI)	H5N1 in humans
Calves (2006d)	Stress, large groups, space allowance, mixing from different sources, restocking	Increased susceptibility, cross-contamination, pathogens spread	Risk of foodborne pathogen contamination (i.e. <i>Salmonella</i>)
Pigs (2005b)	Bedding materials (e.g. straw). Floor types (e.g. floors causing abrasion to feet or snout)	Vehicle of FMD or Aujeszky disease. Spread of FMD, Vesicular stomatitis.	
Pigs (2005b, 2007a, 2007b, 2007c)	Outdoor systems	Wildlife pathogens (i.e. <i>Toxoplasma</i> , <i>Salmonella</i> , <i>Brucella</i>)	Foodborne pathogens Risk of Toxoplasmosis, Salmonellosis and Brucellosis

in this new Regulation take into consideration the conclusions and recommendations, from previous EFSA Scientific Opinions on Animal Transport (EFSA, 2004c, 2004d) and hence are based on scientific evidence. Table 3 presents some examples of the impact of the scientifically based conclusions and recommendations on the measures laid down in the Regulation.

The EFSA opinion on the animal health and welfare risks associated with the import of wild birds other than poultry into the European Union (EFSA, 2006a) was adopted in October 2006. Following some of the recommendations of the Scientific Opinion, the European Commission adopted in November 2006 a Commission Decision (EC, 2006) which, in summary, permanently banned the

import of “pet birds” and wild caught birds, allowing only the import of captive-bred birds only from authorised countries.

The AHAW Panel adopted in 2004 and 2006 two scientific opinions (EFSA, 2004c; 2006c) on the welfare aspects of the main systems of stunning and killing (main commercial species: cattle, sheep, pigs, poultry, horses and farmed fish and deer, goats, rabbits, ostriches, ducks, geese and quail, respectively) with consideration of Directive 93/119/EC. The opinions focused on the welfare at the point of application of the main stunning and stun/killing methods. Killing of animals without stunning and stunning and killing methods for disease control were also considered. The two EFSA opinions on slaughter

and killing, taken together, address stunning and killing of most species kept for farming purposes within the EU. The Commission proposal for a Council Regulation on the protection of animals at the time of killing made last 18 September 2008 (EC, 2008), clearly states that EU legislation on this area should be updated to take into account those EFSA scientific opinions. It is also written in the proposal that fish species are not included, as further scientific opinions and economic evaluation on farmed fish are also needed. Furthermore, EFSA received a mandate on the welfare aspects of the stunning and killing of farmed fish on June 2008 and the respective scientific opinions are expected to be adopted during 2009.

Table 3. Impact of the scientific evidence in the provisions of Regulation (EC) No. 1/2005 (adapted from Ribó et al., 2008b).

Conclusions and Recommendations	Council Regulation (1/2005)
The education of personnel involved in handling animals, moving animals, or driving vehicles can greatly improve animal welfare.	Article 6. Transporters. Article 16. Training of staff Article 17. Training courses
Animals unfit to travel because they are injured or diseased or because their physiological state should not be transported	Annex I. Chapter I. Fitness for transport. 2. Animals that are injured or that present physiological weakness or pathological processes shall not be considered for transport.
Behaviour modifying drugs should not be given to animals in place of good practice for the transport of any animal. Using some drugs when animals are transported by air may be harmful.	Annex I. Chapter I. Fitness for transport. 5. Sedatives shall not be used on animals to be transported unless strictly necessary to ensure the welfare of the animals and shall only be used under veterinary supervision.
No animal should be required to negotiate a ramp steeper than 20°.	Annex I. Chapter III. Transport Practices. 1. (a) Ramps shall not be steeper than an angle of 20°.
Animals which may fight if mixed should not be mixed.	Annex I. Chapter III. Transport Practices. Separation 1.12 Animals shall be handled and transported separately...
Food and water should be provided at different time periods after a journey commences ...	Annex I. Chapter V. Watering and feeding interval, journey times and resting periods.

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