

## TECHNICAL REPORT OF EFSA

# Outcome of the Stakeholders and Public consultation on Health and Welfare aspects of genetic selection in broilers: <sup>1</sup>

European Food Safety Authority<sup>2, 3</sup>

European Food Safety Authority (EFSA), Parma, Italy

### ABSTRACT

The European Commission requested the European Food Safety Authority (EFSA) to gather and assess all data available and produce two scientific opinions on: The influence of genetic parameters on the welfare and the resistance to stress of commercial broilers; and The welfare aspects of the management and housing of the grand-parent and parent stocks raised and kept for breeding purposes. In order to ensure that the opinions were based on comprehensive, relevant and up-to-date information, the Animal Health and Welfare (AHAW) Unit undertook a consultation with its stakeholders through a Technical Meeting at the inception of the assessment (Autumn 2009) followed by a public Web-consultation on draft outputs (Spring 2010). Representatives of the poultry industry, breeding companies, research groups, NGOs, national and international institutions attended the Technical Meeting. The participants exchanged views on scientific and technical aspects related to welfare of broilers, with special focus on data availability, data sources, and clarification of the request from the European Commission. Participants agreed that poultry breeding for meat is a dynamic industry and stressed the importance of having access to the most recent data. It was concluded that the lack of a harmonised system for data collation may hamper the assessment. A web-based public consultation on the draft scientific report was organised in the spring of 2010 and online published invitation for submission of written comments by deadline set on 14 April 2010. The consultation produced some valuable comments, information and data. These were incorporated into the draft report when the AHAW Panel considered their scientific basis to be valid and robust. Base one this draft report the two scientific opinions were developed (on the influence of genetic selection on the welfare and resistance to stress of commercial broilers<sup>4</sup>; and the welfare of housing and management for broiler breeders<sup>5</sup>).

**KEY WORDS:** Meat producing chicken, broiler, broiler breeders, genetic selection, health, welfare, diseases

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<sup>1</sup> On request of EFSA, Question No EFSA –Q-2009-00798, issued on 26 March 2010

<sup>2</sup> Correspondence: ahaw@efsa.europa.eu

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<sup>4</sup> EFSA Panel on Animal Health and Welfare (AHAW): Scientific Opinion on the influence of genetic parameters on the welfare and the resistance to stress of commercial broilers. EFSA Journal 2010; 8 (7):1666. [82 pp.]. doi:10.2903/j.efsa.2010.1666. Available online: [www.efsa.europa.eu](http://www.efsa.europa.eu)

<sup>5</sup> EFSA Panel on Animal Health and Welfare (AHAW): Scientific Opinion on welfare aspects of the management and housing of the grand-parent and parent stocks raised and kept for breeding purposes. EFSA Journal 2010; 8(7):1667. [81 pp.]. doi:10.2903/j.efsa.2010.1667 Available online: [www.efsa.europa.eu](http://www.efsa.europa.eu)

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## SUMMARY

The European Commission has requested the European Food Safety Authority (EFSA) to gather and assess all data available and produce two scientific opinions on: The influence of genetic parameters on the welfare and the resistance to stress of commercial broilers; and The welfare aspects of the management and housing of the grand-parent and parent stocks raised and kept for breeding purposes. In order to ensure that the EFSA scientific outputs are based on comprehensive, relevant information, the Animal Health and Welfare (AHAW) Unit has undertaken a public consultation with its stakeholders. The Public Consultation on health and welfare aspects of genetic selection of broilers was implemented through a Technical Meeting at the inception of the assessment (September 2009) followed by a Web-consultation on draft outputs (April 2010).

Representatives of the poultry industry, breeding companies, research groups, NGOs, national and international institutions attended the Technical Meeting. The participants exchanged views on scientific and technical aspects related to welfare of broilers, with special focus on data availability, data sources, and clarification of the request from the European Commission. It was concluded that genetic background, management and environment contribute to the welfare of the birds and hence need to be considered jointly in the scientific assessment. Participants agreed that poultry breeding for meat is a dynamic sector and stressed the importance of having access to the most recent data. It was concluded that the lack of a harmonised system for data collation may hamper the assessment. Methodologies for data analysis were presented to tackle these difficulties and to identify data gaps.

In line with EFSA's policy on openness and transparency, and in the framework of initial plan, a web-based consultation on the draft scientific outputs was organised in the spring of 2010. Interested parties were invited to submit written comments by deadline set on 14 April, 2010 at 12.00. The draft report has been revised and developed in the scientific opinions, and information and data were amended or included only where the AHAW WG and Panel considered the scientific basis valid and robust.

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## BACKGROUND

The 2000 Report<sup>6</sup> of the Scientific Committee on Animal Health and Animal Welfare on the welfare of broilers concluded that a wide range of metabolic and behavioural traits in broilers have been changed by selection practices. The Report concluded that many welfare problems in broilers seem to emanate from the way the birds and the parent stocks are bred.

Council Directive 2007/43/EC<sup>7</sup> laying down minimum rules for the protection of chickens kept for meat production calls for the European Commission to submit to the European Parliament and Council a report concerning the influence of genetic selection on identified deficiencies resulting in poor welfare of chickens.

The European Commission has requested European Food Safety Authority (EFSA) to assess all relevant available information from scientific studies and proprietary sources. The European Commission has also requested EFSA to issue two Scientific Opinions: the first one on The influence of genetic selection on the welfare and resistance to stress of commercial broilers and the second one on The welfare of broiler parent and grandparent stocks raised and kept for breeding purposes. The background and terms of reference of the mandate received from the European Commission is appended to this report (Appendix A).

## TERMS OF REFERENCE

In order to ensure EFSA scientific outputs are based on comprehensive, relevant information, the Animal Health and Welfare (AHAW) Unit will organise a public consultation with its stakeholders according to the EFSA's approach on Public Consultations on Scientific outputs<sup>8</sup>.

The Consultation<sup>9</sup> on health and welfare aspects of genetic selection of broilers will be proposed to stakeholders as a two tier process: a Technical Meeting at the early stage of the scientific assessment process (Autumn 2009) and a Web-consultation on the draft outputs (Spring 2010).

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<sup>6</sup> SCAHAW, 2000. The welfare of chickens kept for meat production (broilers). Report of the scientific committee on animal health and animal welfare (adopted 21 March 2000), European commission, Health and consumer protection directorate-general. 149 PP.

<sup>7</sup> Council Directive 2007/43/EC of 28 June 2007 laying down minimum rules for the protection of chickens kept for meat production. OJ L 182, 12.7.2007, p. 19–28.

<sup>8</sup> [http://www.efsa.europa.eu/EFSA/AboutEfsa/efsa\\_locale-1178620753812\\_managementdocuments.htm](http://www.efsa.europa.eu/EFSA/AboutEfsa/efsa_locale-1178620753812_managementdocuments.htm)

<sup>9</sup> <http://registerofquestions.efsa.europa.eu/roqFrontend/questionsListLoader?panel=ALL>

## THE CONSULTATION

The European Commission has requested the European Food Safety Authority (EFSA) to gather and assess all data available and produce two scientific opinions on: i) The influence of genetic parameters on the welfare and the resistance to stress of commercial broilers; and ii) The welfare aspects of the management and housing of the grand-parent and parent stocks raised and kept for breeding purposes. Based on these opinions, the Commission will submit a report concerning the influence of genetic parameters on the welfare of chickens to the European Parliament and to the Council<sup>10</sup>.

In order to support the work of the Animal Health and Welfare (AHAW) Panel, two *ad hoc* expert working groups were established to draft a scientific report on the current knowledge on welfare aspects of genetic selection in broilers and broiler breeders. The report has constituted the scientific ground for the two Scientific Opinions<sup>11</sup> adopted by the AHAW panel at the Plenary meeting on 24 June 2010.

In parallel, a public call for data<sup>12</sup> on the health and welfare aspects of genetic selection of broilers has been launched by EFSA. This call was designed to facilitate the data collection requested by the European Commission and to ensure that the scientific opinions of the AHAW panel are based on all available published scientific studies and proprietary information relevant to the subject. A technical report within collected data through the call was published on the EFSA web page<sup>13</sup>. Further to welfare aspects, the Commission also mentioned a possible request to assess the influence of genetic selection of commercial broilers towards resistance to disease agents. Therefore it was decided that the call would also encompass animal health aspects of genetic selection in broilers.

EFSA called for proposals by way of Article 36 of its founding regulation to carry out data collection, integrate information from the public call for data, and process along with their systematic evaluation. Proposals have assisted the *ad hoc* expert working groups to assess current knowledge on welfare aspects of genetic selection in broilers and broiler breeders.

The GANTT chart (**Table 1**) below provides an overview of the activities undertaken by EFSA on the matter and illustrates the schedule:

**Table 1** Overview of the work plan on the requested themes (GANTT chart)

Activities	2009						2010						
	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Working Groups	[Shaded bar from Jun 2009 to Jun 2010]												
Article 36 grant	[Shaded bar from Jun 2009 to Jun 2010]												
Call for data		[Shaded bar from Jul 2009 to Oct 2009]					[Shaded bar from Jan 2010 to Apr 2010]						
Consultations				[Shaded bar from Sep 2009 to Oct 2009]								[Shaded bar from Apr 2010 to May 2010]	

The Animal Health and Welfare (AHAW) Unit opened a consultation with its stakeholders and public in order to ensure that the EFSA scientific outputs were based on comprehensive, relevant

<sup>10</sup> Council Directive 2007/43/EC of 28 June 2007 laying down minimum rules for the protection of chickens kept for meat production. OJ L 182, 12.7.2007, p. 19–28.

<sup>11</sup> Scientific Opinion on the influence of genetic parameters on the welfare and the resistance to stress of commercial broilers. EFSA Journal 2010; 8 (7):1666. [82 pp.]. doi:10.2903/j.efsa.2010.1666 and Scientific Opinion on welfare aspects of the management and housing of the grand-parent and parent stocks raised and kept for breeding purposes. EFSA Journal 2010; 8(7):1667. [81 pp.]. doi:10.2903/j.efsa.2010.1667. Available online: [www.efsa.europa.eu](http://www.efsa.europa.eu)

<sup>12</sup> [http://www.efsa.europa.eu/EFSA/efsa\\_locale-1178620753812\\_1211902687473.htm](http://www.efsa.europa.eu/EFSA/efsa_locale-1178620753812_1211902687473.htm)

<sup>13</sup> <http://www.efsa.europa.eu/en/scdocs/scdoc/1439.htm>

information. This report presents the major outcomes of the Stakeholders and Public Consultation on health and welfare aspects of genetic selection of broilers.

## **1. Technical Meeting**

The Technical Meeting (hereafter the Meeting) with stakeholders was held on the 23 September, 2009, in Brussels<sup>14</sup>.

### **1.1. Objectives**

The overall objective of the Meeting was to exchange views on the welfare implications linked to the genetic selection in broilers, and welfare aspects related to the management and housing of broiler breeders.

The Meeting provided an opportunity to inform stakeholders about the background and scope of request received from the European Commission, to discuss the challenges of data collection and to foster further cooperation with all interested parties.

The Meeting comprised an information session to present the background and scope of the mandate, purpose of data collection (public call for data, Article 36 grant) and methodological approach developed by the AHAW Panel and its Working Groups.

The agenda of the Meeting is appended to this report (Appendix B).

### **1.2. Participants**

The Meeting was open to all parties with a demonstrable interest in the assessment of health and welfare aspects of genetic selection in broilers and broiler breeders. The agenda was relevant for technical and scientific representatives of the meat producing poultry industry, breeding companies, universities, research groups and institutions. EFSA also encouraged the participation from EU funded research projects and consortia.

The Meeting was announced on the EFSA website on 8 August 2009. September 11<sup>th</sup> was given as a deadline for online registration of participants. Registered participants were screened by AHAW secretariat for their eligibility before they received an invitation and information package. 42 people representing 34 bodies were invited to participate to the Meeting.

A total of 29 representatives of the poultry industry, breeding companies, research groups, NGOs, national and international institutions attended the Meeting. Also 13 members of EFSA Working Groups on Broiler genetics and welfare and Broiler breeder welfare participated in the Meeting.

The list of participants to the Meeting is appended to this report (Appendix C).

### **1.3. Statements by participants**

Participants were given the option to make a statement on how they perceive the mandate under consideration and related issues. Three statements were made during the Meeting by the following organisations: i) Eurogroup for Animals, ii) Compassion in World Farming, iii) the European Forum of Farm Animal Breeders (EFFAB) and European Poultry Breeders (EPB).

The statements are appended to this report (Appendices C, D, and E respectively).

Compassion in World Farming and Eurogroup stressed leg disorders and heart failure in broilers and severe food restriction and hunger in breeding birds as the most serious health and welfare problems. Actions identified to address these issues include the need to use slower growing breeds, and adopting

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<sup>14</sup> [http://www.efsa.europa.eu/EFSA/efsa\\_locale-1178620753812\\_1211902787079.htm](http://www.efsa.europa.eu/EFSA/efsa_locale-1178620753812_1211902787079.htm)

practices avoiding mutilations and feed restriction in broiler breeders. The upper limit of 45g average live weight gain per day is thought to have potential for improving the welfare of the birds.

The EFFAB, EPB, and their broiler breeder members highlighted the increase in the world population and subsequent demand for meat. They emphasised how the market drives the breeding business. Selection involves, among others, welfare related traits that have contributed to improve the health and welfare of broilers and breeders over the past years. However, genotype by environment effect is large as shown by the variability in field performance.

#### **1.4. Main issues discussed**

The participants exchanged views on scientific and technical aspects related to the welfare of commercial broilers, with special focus on data availability, data sources, and clarification of the scope of the request from the European Commission. Further collaboration with stakeholders and interested parties was discussed during the Meeting with a view to ensure the best contributions to the call for data.

It was agreed that the genetic background of the birds, and the management of their environment contribute to the welfare of the birds and hence need to be considered in the assessment.

Participants agreed that poultry breeding for meat is a dynamic sector and stressed the importance of having access to the most recent data.

It was concluded that the lack of a harmonised system for data collation may hamper scientific risk assessment.

Methodologies for data analysis were presented to tackle these difficulties and to identify data gaps.

## **2. Web-consultation**

In line with EFSA's policy on openness and transparency, and in the framework of initial plan, a web-based consultation on the draft scientific outputs was organised in the spring of 2010. It was published online ([www.efsa.europa.eu](http://www.efsa.europa.eu)) an invitation for submission of written comments by 14th April 2010 at 12.00<sup>15</sup>. The comments were sent exclusively by means of an electronic template, provided with the then-current version of the draft report. The draft report for consultation combined the two topics: The influence of genetic selection on the welfare and resistance to stress of commercial broilers; and The welfare of housing and management for broiler breeders, into a single file. Development of an opinion for each topic was foreseen. The participants were requested to submit comments and to refer to the line and page numbers. Technical criteria for not considering the comments were also presented and are listed below:

- Comments submitted by e-mail or by post cannot be taken into account and that such a submission will not be considered if it is:
  - submitted after the deadline set out in the call
  - presented in any form other than that provided in the instructions and template
  - not related to the content of the document
  - containing complaints against institutions, personal accusations, irrelevant or offensive statements or material

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<sup>15</sup> <http://www.efsa.europa.eu/en/consultationsclosed/call/ahaw100330.htm>

- related to policy or risk management aspects, which is out of the scope of EFSA's activity.

All comments were recorded (Annex F) and assessed by the established working group in the mandates on: The influence of genetic selection on the welfare and resistance to stress of commercial broilers; The welfare of housing and management for broiler breeders. The EFSA's AHAW Panel considered relevant comments in drafting the scientific opinions on the influence of genetic parameters on the welfare and the resistance to stress of commercial broilers and on welfare aspects of the management and housing of the grand-parent and parent stocks raised and kept for breeding purposes.

## **2.1. Objectives**

The set objectives of the consultation were to gather the widest range of views to help finalise two scientific opinions on the welfare aspects of genetic selection in chickens raised specifically for meat production (broilers), and provide the most up-to-date and comprehensive scientific advice to EU decision makers.

The web-consultation gave the opportunity to inform the stakeholders and public about the draft Opinions, the stage of development, and to receive feed back on the data and its quality.

## **2.2. Participants**

The process was open to all parties that had demonstrated an interest in the assessment of health and welfare aspects of genetic selection in broilers and welfare of broiler breeders. The consultation was web based and announced on the official web site of EFSA.

Comments were received by different organisations:

Compassion in World Farming – UK;

Department for Environment, Food and Rural Affairs – UK;

Dutch Society for the Protection of Animals – NLD;

EFFAB (The European Forum of Farm Animal Breeders) - NLD,

AVEC (Association of Poultry Processors and Poultry Trade in the EU countries – BEL;

EPB (Association of the European Poultry Breeders),

COPA-COGECA ((General Confederation of Agricultural Cooperatives). – NLD;

K.U. Leuven (Katholieke Universiteit Leuven) – BEL;

RSPCA (Royal Society for the Prevention of Cruelty to Animals) – UK;

The Hebrew University- ISR;

University of Milan – ITA;

Senior poultry journalist – FRA.

Most of the organisations were presented at the meeting with stakeholders in September 2009.



### 2.3. Comments

The total number of electronic submissions of comments was 114. Most of the submissions contain multiple comments on the draft opinions. Some of them were technical (corrections of technical mistakes, suggestions for better expression of the ideas, identification of missed quotation or references), others provided scientific information (presenting data and references relevant to the themes presented in the draft report), or commented on themes in areas outside the scope of EFSA (e.g. management, ethics, policy).

### 2.4. Main issues commented

The comments targeted different chapters (topics) and sub chapters (subtopics) of the draft report:

- Housing and management of broiler breeders (parents and grandparents) - Hatching; Mutilations; Housing during the rearing period; Management during the rearing period; Housing during the production period; Management during the production period; Culling methods; Transport issues; Abattoir issues; Mini (or dwarf) hens; Slow growing breeds and systems of production. (18 submissions, sent in by 6 organisations)
- Welfare of broiler breeders (parent stock) - Feed restriction; Aggression; Mutilations; Environmental enrichment; Ammonia and dust; Culling; Cage housing; Leg weakness; Egg peritonitis/ Salpingitis in females; Metabolic disorders; Training of stockpersons; Infectious diseases; Control options for airborne transmission of infectious agents from farms. (31 submissions, sent in by 5 organisations)
- Welfare of broilers – Mortality; Skeletal disorders; Muscle disorders in some genetic lines; Contact dermatitis; Ascites, pericarditis, sudden death syndrome and spiking mortality syndrome; Respiratory and mucous membrane problems; Thermal discomfort; Behavioural restriction; Environmental factors linked to welfare problems; Nutrition and feed management, water; Digestive problems. (32 submissions, sent in by 6 organisations)
- Genetic selection of broilers - Production traits; Health, fitness and welfare traits, Reproduction traits; Trait combination – selection indices; Genetic selection by production system; Policies of breeding companies regarding selection for welfare versus production. (12 submissions, sent by 4 organisations)
- Genotype by environment interaction - Welfare aspect of Genetic (G) × Environment (E) interaction, How do the breeding companies deal with G × E interaction, Importance of the genetic diversity. (4 submissions, sent in by 1 organisation)
- Trend analysis of genetic selection and welfare - Indicators used in practice. (3 submissions, sent by 3 organisations)
- Technical comments to – Introduction, (12 submissions, sent in by 4 organisation and 1 individual)

Most of the participants in the web-consultation have sent comments to more than 1 part of the document.

The information, data and technical comments received were included and addressed (Appendix F, Comments Dealt) only where the AHAW WG and Panel considered the scientific basis valid and robust. The document published for consultation was revised and developed into two scientific opinions on: genetics and welfare of commercial broilers; and the welfare of housing and management for broiler breeders.

## CONCLUSIONS

There was involvement of a large number of organisations and participants in the process of consultation (technical meeting and web-consultation) and their continuing interest in the two topics (The influence of genetic selection on the welfare and resistance to stress of commercial broilers and The welfare of broiler parent and grandparent stocks raised and kept for breeding purposes).

There was a common understanding and agreement that broiler selection is dynamic and it is of great importance to have access to the most recent data for performing a proper risk assessment.

Updated data and information were collected and feed-back on the available data was received.

The document published for consultation has been revised and developed into two scientific opinions. This report presents the main discussion points, comments and action taken by EFSA.

## APPENDICES

### A. MANDATE SUBMITTED BY THE EUROPEAN COMMISSION

#### Background as provided by the commission

The Community Action Plan on the Protection and Welfare of Animals has as one of the main areas of action “upgrading existing minimum standards for animal protection and welfare as well as possibly elaborating minimum standards for species or issues that are not currently addressed in EU legislation”. Council Directive 2007/43/EC laying down minimum rules for the protection of chickens kept for meat production calls for the Commission to submit to the European Parliament and to the Council a report concerning the influence of genetic parameters on identified deficiencies resulting in poor welfare of chickens.

The report of the Scientific Committee on Animal Health and Animal Welfare of 21 March 2000 on the Welfare of Chickens Kept for Meat Production (Broilers) concluded that a wide range of metabolic and behavioural traits in broilers has been changed by selection practices. It seems that many welfare problems in broilers emanate from the way the animals and the parent stock are bred. In particular, major concerns for animal welfare are the metabolic disorders resulting in leg problems, ascites and sudden death syndrome and other health problems. Genetic selection practises might also influence resistance to stress. The report concluded there are welfare concerns about the way broiler breeder birds are kept, in particular with regards to feed and space restrictions.

#### Terms of reference as provided by the commission

The Commission therefore requests EFSA to assess all the scientific and commercial information available on the genetics of broilers, as well as on the welfare of grandparent and parent stocks and then to issue two scientific opinions, the first one on the influence of these genetic parameters on the welfare and the resistance to stress of commercial broilers and the second one on the welfare of grandparent and parent stocks raised and kept for breeding purposes.

It is preferable to carry out the assessments in two steps.

As first step of the mandate, all data available worldwide on genetics either from scientific studies or from stakeholders and breeding companies should be collected and assessed. Furthermore, the data on the welfare aspects of the management and housing of the grand-parents and parents stocks raised and kept for breeding purposes should be also collected and assessed. Account should be taken of the results of the research project entitled “Broiler breeder production, solving the paradox” as well as of the new scientific development in this area. The above mentioned scientific and commercial data should be assessed by 28 February, 2010.

As a second step and considering the Scientific Report provided from the data collection, two parallel Scientific Opinions, following a harmonised approach, should be developed:

- to assess which elements of broiler breeder bird selection have an impact on the welfare of commercial broilers and on their resistance to stress. Recommendations on how negative impacts could be minimised through different selection criteria should be issued.
- to address the welfare aspects of the management and housing of the grand-parent and parent stocks raised and kept for breeding purposes.

On the basis of the results of the data collection, the terms of reference of the two scientific opinions may be more precisely redefined.

**AGENDA OF THE TECHNICAL MEETING**

09:00-09:30	Registration of participants	
09:30-10:00	Introduction to the Animal Health and Welfare (AHAW) Panel of EFSA	P. Have
10:00-10:15	A request from the Commission to publish two Scientific Opinions on welfare aspects of genetic selection in broilers and housing and management of broiler breeders	J. Hartung
10:15-11:00	Statements from participating organisations	
11:00-11:30	Coffee break	
11:30-12:00	Public Call for Data on health and welfare aspects of genetic selection in broilers	T. Oltenacu
12:00-13:00	Exchange of views on data sources, relevance, format, and availability	
13:00-14:00	Lunch	
14:00-14:30	Systematic review of information and data on health and welfare aspects of genetic selection in broilers	D. Lefebvre
14:30-15:00	Methodological approach to assessment of welfare aspects of genetic selection in broiler, housing and management of broiler breeders	L. Collins
15:00-15:30	General discussion	
15:30-16:00	Draft report on the Technical Meeting	F. Berthe
16:00-16:30	Concluding remarks and way forward	P. Have

## B. LIST OF PARTICIPANTS TO THE TECHNICAL MEETING

**Table 2** List of participants of technical meeting on animal welfare aspect of genetic selection in broilers and broiler breeders, Brussels, 23 September 2009

	Surname	Name	Affiliation
1	AMBROSEN	Thorkil	Danish Agriculture and Food Council
2	BACHMEIER	Josef	PVSG Poultry Veterinary Study Group of the EU
3	BANOS	Georgios	EFSA WG member
4	BERG	Charlotte (Lotta)	EFSA WG member
5	BERNARDI	Zeno	A.V.E.C. - Association of Poultry Processors and Poultry Trade in the EU
6	BERTHE	Franck	EFSA - AHAW Unit
7	BOEKHOLT VAN	Paul	EPB-Association of the European poultry Breeders
8	BONAFOS	Laurence	European Commission
9	BONJOUR	Eric	Sustainable Farm Animal Breeding and Reproduction Technology Platform (FABRE TP)
10	COLLINS	Lisa	EFSA WG member
11	COOPER	Mark	European Forum of Farm Animal Breeders
12	COOPER	Marc	Eurogroup for animals
13	DE JONG	Ingrid	EFSA WG member
14	DE JONG	Marije	Eurogroup for Animals
15	DIVANACH	Françoise	Ministry of Agriculture, Nature and Food Quality
16	GEORGIEV	Milen	EFSA - AHAW Unit
17	GRUDNIK	Tomasz	EFSA - AHAW Unit
18	GUEMENE	Daniel	SYSAAF- INRA
19	HAVE	Per	EFSA - AHAW Unit
20	HARTUNG	Jörg	EFSA WG member / AHAW Panel
21	HOCKING	Paul	EFSA WG member
22	HUNEAU	Adeline	French Agency for Food Safety
23	JEGO	Yves	Sustainable Farm Animal Breeding and Reproduction Technology Platform (FABRE TP)
24	KEELING	Linda	EFSA WG member / AHAW Panel
25	KNOWLES	Toby	University of Bristol
26	LASTIKKA	Lea	Finland's Poultry Association
27	LAUGHLIN	Kenneth	European Forum of farm Animal breeders [EFFAB]
28	LEFEBVRE	Diane	INRA
29	MORI	Stefania	EFSA - AHAW Unit
30	MUTIMER	Roy	Cobb Europe

31	NEETESON	Anne-Marie	Animal Task Force
32	NIELSEN	Birte L	Danish Animal Welfare Council
33	NOVAK	Janja	Department for Environment, Food and Rural Affairs
34	ODÉN	Kristina	Swedish Board of Agriculture
35	OLTENACU	Toni	EFSA WG member / AHAW Panel
36	RODENBURG	Bas	Wageningen University
37	SORENSEN	Poul	EFSA WG member
38	STEVENSON	Peter	Compassion in World Farming
39	STUARDO	Leopoldo	World Organisation for Animal Health - OIE
40	VERMEEREN	Cornelius	A.V.E.C. - Association of Poultry Processors and Poultry Trade in the EU
41	VILLAGRÁ-GARCÍA	Arantxa	Instituto Valenciano de Investigaciones Agrarias
42	VILLALBA	Teresa	Ministry of Environment, Rural and Marine Affairs
43	VINCO	Leonardo James	Istituto Zooprofilattico Sperimentale della Lombardia ed EmiliaRomagna
44	WALDENSTEDT	Lotta	Swedish Poultry Meat Association

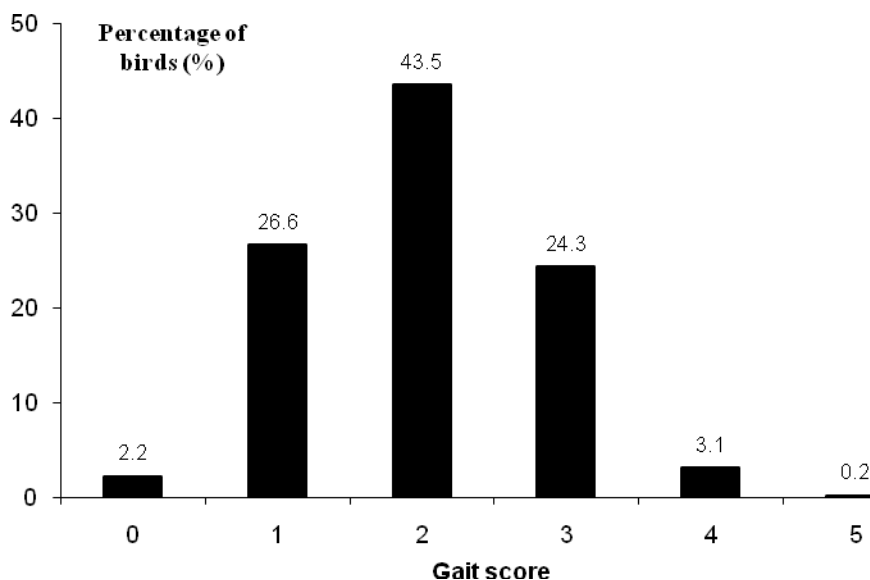
### C. STATEMENT BY THE EUROGROUP FOR ANIMALS

Genetic selection for improved performance does not necessarily result in poorer welfare. However, there can come a point at which intense and disproportionate selection for individual production related traits begin to have an increasingly negative impact on the animal. In the case of genetic selection for fast growth in chickens, published research clearly demonstrates that this point has been reached and passed.

#### Fast growth and broiler welfare

Fast growth in broilers has been shown to be responsible for not only most of the welfare problems seen in broilers, but also for the most severe. For example, rapid growth rates (eg 57g per bird per day) can significantly contribute to the development of ascites (Scheele et al 1997; SCAHAW 2000; van Middelkoop et al 2002; Bessei 2006), sudden death syndrome (Maxwell & Robertson 2000; SCAHAW 2000; van Middelkoop et al 2002; Bessei 2006) and leg disorders (SCAHAW 2000; Kestin et al 2001; van Middelkoop et al 2002; Bessei 2006).

Focussing on leg problems, Knowles et al (2008) conducted a comprehensive survey with five major UK producers, who accounted for 50% of UK production, to examine the prevalence and severity of lameness in commercial broiler flocks. The walking ability of chickens was scored on a scale of zero to five: score zero representing birds with normal walking ability and score five representing birds that were unable to stand. The study revealed that only 2.2% of broilers had a normal walking ability (score zero) with 97.8% having a detectable leg problem (scores two to five) (Figure 1). Approximately one in four (27.6%) broilers had a gait score of three or above. This is significant, as birds with gait scores of this magnitude are likely to be experiencing some degree of pain (Danbury et al 2000). Over 3% of the broilers were almost unable to walk (scores four and five). The proportion of birds in each gait score category were considered conservative estimates and occurred despite the implementation of culling policies designed to remove lame birds from the flocks.



**Figure 1** The estimated proportion of commercial UK broilers in each gait score category (Knowles et al., 2008)

The study examined the relative impact of various risk factors, such as stocking density and bird age, on bird locomotion and clearly demonstrated that fast growth rate was the primary risk factor responsible for lameness in broilers. The study concluded that modern genotypes, biased towards fast

growth rates, have been detrimental to poultry welfare in compromising the ability of chickens to walk.

Conversely, genetically slower growing broilers have been shown to suffer less from heart and circulatory problems and have better leg health and lower mortality rates (Middelkoop et al 2002; Bessei 2006).

### **Fast growth and broiler breeder welfare**

Broiler breeders can have a similar or greater growth rate potential compared to their meat producing offspring. However, as they are required to live for a considerably longer period, their growth rate has to be managed. If broiler breeders were fed ad libitum many would become lame and mortality would be excessively high (SCAHAW 2000). For example, one study reported a mortality level of 46% in ad libitum fed female broiler breeders (Hocking et al 2002). Therefore, to slow their rate of growth, they are subject to severe levels of feed restriction. Broiler breeders can be fed as little as one fifth of the quantity of food that they want to eat, and feed restriction of up to 50% may continue during adulthood (Mench 2002).

The impact of this severe level of feed restriction can be illustrated by comparing the body weights of the breeder birds with broilers of the same age. The following data are taken from the most recent (June 2007) Aviagen performance objectives booklet for the Ross 308. At 39 days of age the female broiler will weigh 2.2kg (representing typical slaughter weight), whereas the feed restricted female broiler breeder at the same age will weigh circa 615g, ie approximately one quarter of the broiler's body weight. Similarly, at 35 days of age the male broiler will weigh 2.2kg, whereas the feed restricted male broiler breeder will weigh 900g. It would take 140 days for the female broiler breeder to reach the same weight as the broiler at 39 days, ie 2.2kg. Similarly, it would take 105 days for the male broiler breeder to reach a weight of 2.2kg, a weight achieved by the male broiler in just 35 days.

As a result of this practice, many studies have concluded that feed restricted broilers are chronically hungry, frustrated and stressed (Savory Maros & Rutter 1993). This state of compromised welfare in broiler breeders has been acknowledged by UK Government (Defra Code of Recommendations for the Welfare of Livestock: Meat chickens and breeding chickens, 2003), the UK Farm Animal Welfare Council (Report on the Welfare of Broiler Breeders, 1998) and the EU Scientific Committee on Animal Health and Animal Welfare (The Welfare of Chickens Kept for Meat Production, 2000).

### **Conclusion**

Eurogroup believes that urgent action is essential to address the serious health and welfare problems seen in fast growing broilers. The use of genetically slower growing broilers should be strongly encouraged. Major improvements in welfare could be achieved both for birds reared for the table and breeding birds by using strains with a genetic growth rate potential of no more than 45g per day on average, as stated within the RSPCA welfare standards for chickens (RSPCA, 2008). This is a commercially viable option.

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#### D. STATEMENT BY COMPASSION IN WORLD FARMING

The scientific evidence shows clearly that the way commercial broiler chickens and parent stock are bred inflicts serious health and welfare problems on the birds. Genetic selection for faster growth rate leads to painful leg disorders and heart failure in birds reared for meat and to severe food restriction and hunger in the breeding birds.

A recent large-scale UK study into leg disorders in broilers found that 27.6% of the chickens had gait scores of 3 or more, i.e. lameness that is likely to be painful. The study concluded that “the primary risk factors associated with impaired locomotion and poor leg health are those specifically associated with rate of growth” (Knowles et al, 2008).

The figure of 27.6% of broilers having gait scores of 3 or more is broadly similar to a Danish study that found 31.1% to have gait scores of 3 or more (Sanotra et al, 2001) and a Swedish study that found 20.4% to have such scores (Sanotra and Berg, 2003). The 2008 figure of 27.6% is almost identical to the results of a 1992 UK study that found almost 26% of broilers to have gait scores of 3 or more (Kestin et al, 1992). This suggests that there has been little improvement in the last 15 years.

A review of broiler welfare (Bessei, 2006) concluded that slower-growing breeds have fewer leg problems and metabolic diseases and that mortality levels are lower in slower-growing breeds. In addition, there is now substantial evidence that lameness is associated with considerable pain in broilers (e.g. Mc Geown et al, 1999; Danbury et al, 2000).

Scientific literature also shows that selection for fast growth rate increases the risk for Sudden Death Syndrome (SDS) and ascites in broilers (e.g. Grashorn, 1993; Scheele et al, 1997) and is associated with reduced behavioural activity in the birds and skeletal disorders, causing pain and suffering (e.g. Weeks et al, 2000; Kjaer and Mench, 2003). Based on the considerable scientific evidence available, we believe that the use of slower growing breeds with lower incidence of leg disorders and heart diseases should be urgently encouraged in the broiler industry.

Concerns regarding the welfare of broiler breeders especially relate to feed restriction and male mutilations. Feed restricted breeders are chronically hungry, frustrated and stressed (Savory et al, 1993) and develop a range of abnormal behaviours such as stereotypic pecking as a result of frustration (Mench, 2002). In addition, male breeders are often subjected to a range of mutilations, which are all highly likely to cause acute pain at the time of procedure. Some operations such as beak-trimming can also have longer term or chronic impacts on welfare (Duncan and Forkman, 2006). Based on the scientific evidence available, we believe that the welfare of broiler breeders can be further improved by breeding birds whose health can be maintained without feed restriction and by developing breeds and systems which avoid the need for mutilations.

Finally, scientific literature suggests that the selection of broilers for rapid growth and efficient feed conversion has reduced their immunity to disease. Broilers selected for fast growth rate have been found to have lower antibody responses when exposed to infection (Rauw et al, 1998), and some authors have suggested that rapid growth rate substantially reduces broiler viability (Yunis et al, 2002).

In conclusion, Compassion in World Farming believes that urgent action is now essential to address the serious health and welfare problems of intensively farmed broiler chickens. This especially includes the need to use slower growing breeds with lower incidence of leg disorders and heart diseases, and adopting breeds and husbandry practices which could avoid the need for mutilations and feed restriction in broiler breeders. Major improvements in welfare could be achieved both for birds reared for the table and breeding birds by using strains with the genetic potential for a growth rate of no more than an average of 45g live weight gain per day, as required by Freedom Food standards in the UK (RSPCA, 2008).

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## **E. STATEMENT BY EFFAB AND EPB**

The European Forum of Farm Animal Breeders (EFFAB), European Poultry Breeders (EPB), and their broiler breeder members appreciate the EFSA initiative for a stakeholder meeting and the opportunity to provide data, papers and information to support the 19 questions formulated. More specific information can be provided to the expert group.

The world population is increasing - + 40 % by 2050 – as is the demand for meat products. Poultry is consumed worldwide and its production must be sustainable. The European poultry industry produces 11.5 million tonnes of meat of which 8.5 million tonnes is chicken meat (10 % world total) and consumes 17 million tonnes of EU grain (about 12 % of EU cereal production) and have to compete in a global market.

The broiler breeding companies are committed to sustainable poultry breeding. Since the 1970s broiler selection has broadened to include traits which improve welfare outcomes – that this is not generally known means we need to explain our aims and objectives to a wider society. All broiler breeders in EFFAB and EPB recognize the need for ethical programmes and have adopted Code-EFABAR.

Broiler selection is complex, involving many (multiple) traits. These combine factors of welfare and robustness elements, health, production level, economic performance, biosecurity, genetic diversity into sustainable, balanced primary populations. Considering only welfare and genetics could overlook the responsibility to breed in a balanced sustainable way. Welfare cannot be improved via a single measure – various traits that affect welfare and are heritable are being taken into account into the breeding programmes e.g. leg conditions, O<sub>2</sub> saturation...

Many lines are being developed and maintained – from these several cross breeds are supplied to market demands. Not all achieve market share originally predicted, e.g. breeds with the sex-linked dwarf gene developed in the 1970s are limited to significant shares in some parts of the world.

Genotype only partly determines the performance of broilers – genotype by environment (GxE) effect is large. Extensive field data by company or country show about 33 % difference between the best and worst flocks (technically) with larger economic differences. Breeding companies offer extensive practical customer support and training.

The public data (to be provided) show enormous improvements over many years in health and welfare related traits, whilst broilers and breeders have improved greatly. Routine, extensive, comparative public data is lacking in Europe, but much needed for the current requirements.

Customers in different market segments drive the breeding business in an interactive process. Similarly breeders are prepared to give constructive support in the development of these opinions to ensure that they are based on sound scientific data, relevant to today's broiler industry and sensitive to society concerns.

**F. WEB CONSULTATION COMMENTS**

ORGANISATION	CHAPTER_TEXT	COMMENTS_TEXT	COMMENTS_DEAL
RSPCA	6.2. Skeletal disorders	<p>Line 1282: Should this be ‘objective’ and not ‘subjective’? I believe some scoring methods that have been developed are objective.</p> <p>Line 1287: Should be ‘(Hubbard/ISA)’.</p> <p>Line 1315: Replace ‘and’ with ‘of’.</p> <p>Line 1324 - 1325: I’m not sure that the results from the studies referenced in lines 1327 – 1359 support the statement that ‘recent surveys in commercial flocks reported a decrease in the incidence of leg problems...’. This should be amended or at least made clearer.</p> <p>Line 1352: Insert ‘of the’ before ‘countries’. Or, change ‘countries’ to ‘country’.</p>	<p>Comments were taken into account and corrections implemented in the text (see chapter 3.2, EFSA Journal 2010; 8 (7):1666)</p>
RSPCA	6.3. Muscle disorders in some genetic lines	<p>Line 1376 – 1377: Is there any published work to support this state</p>	<p>Reference to source of information was added (see chapter 3.3, EFSA Journal 2010; 8 (7):1666)</p>
RSPCA	6.4. Contact dermatitis	<p>Line 1376 – 1377: Is there any published work to support this statement?</p> <p>Line 1394 -1395: Could this sentence be a little clearer. Also, this sentence seems a little out of place here.</p> <p>Line 1409: Replace full-stop after ‘Italy’ with a comma.</p> <p>Line 1417: Add ‘s’ to ‘bird’.</p> <p>Line 1420: Replace ‘a’ with ‘the’.</p> <p>Line 1378: This section may benefit from reference to the work of both Broom &amp; Reefman (2005) and Pagazaurtundua &amp; Warriss (2006), as they both explore the impact of different rearing systems on contact dermatitis. Broom’s paper examines the impact of different rearing systems on hock-burn, whilst the paper by Pagazaurtundua examines the impact of different rearing systems on foot pad dermatitis.</p> <p>Broom, D.M., &amp; Reefman, N. 2005. Chicken welfare as indicated by lesions on</p>	<p>Reference to the source of information was added</p> <p>Information taken into account, sentence was deleted.</p> <p>Editorial comments – text was corrected</p> <p>Quotations to the papers and references in the list have been added. (see chapter 3.4, EFSA Journal 2010; 8 (7):1666)</p>

ORGANISATION	CHAPTER_TEXT	COMMENTS_TEXT	COMMENTS_DEAL
		<p>carcasses in supermarkets. British Poultry Science, 46:406-414. Pagazaurtundua, A. &amp; Warriss, P.D. 2006. Levels of foot pad dermatitis in broiler chickens reared in 5 different systems. British Poultry Science, 47:529-532.</p>	
RSPCA	6.8. Behavioural restriction	<p>Line 1591: An examination of the influence of stocking density on behaviour would merit further discussion.</p> <p>The SCAHAW (2000) Report concluded that: ‘It is clear from the behaviour and leg disorder studies that stocking density must be 25kg/m<sup>2</sup> or lower for major welfare problems to be largely avoided and that above 30kg/m<sup>2</sup>, even with very good environmental control systems, there is a steep rise in the frequency of serious problems... The greatest threat to broiler welfare due to behavioural restriction would appear to be likely constraints on locomotor and litter directed activities caused by high stocking densities, and consequences for leg weakness, poor litter quality and contact dermatitis.’ Increasing stocking densities have also been shown to be significantly associated with higher gait scores (Knowles et al., 2008).</p> <p>Providing limited space allowance, e.g. stocking at 38kg/m<sup>2</sup>, primarily impacts on behaviour, i.e. walking, lying stretched out, wing stretching and preening (SCAHAW, 2000; Defra, 2003), which will not be improved with better environmental control systems.</p> <p>Furthermore, more disturbances occur between birds kept at higher stocking densities, particularly when birds are trying to rest (Defra, 2003), and the incidence of hock and foot pad burn are positively correlated with stocking density (Haslam, 2005) - increasing significantly between 30 and 38kg/m<sup>2</sup> (RSPCA, 2006).</p> <p>Marian's work on stocking density (2004) was a DEFRA funded study and a full report of her work is available on the Defra website. Birds were stocked at 30, 34, 38, 42 &amp; 46 Kg/m<sup>2</sup>. In this study growth rates were largely unaffected by the stocking density, although there was a downward trend with increasing density:</p> <p>Density (Kg/m<sup>2</sup>) 30.0, 34.0, 38.0, 42.0, and 46.0.</p> <p>Growth Rate (g/day) 50.3, 49.9, 49.7, 48.8, and 47.7, respectively.</p> <p>An interpolation of the data suggests that the growth rate would improve by a maximum of 1g/day over the life of the flock if the density was dropped from 38Kg/m<sup>2</sup> to 30Kg/m<sup>2</sup>.</p> <p>There was also a trend seen of improving gait score. Below is the percentage of birds with an ideal gait score (0), at the different stocking densities.</p>	<p>The information was taken into account and text was rephrased:</p> <p>From: Restriction of behavioural expression is mainly due to lack of space available for each bird.</p> <p>To: Restriction of behavioural expression is partly due to a lack of space available for each bird (see chapter 3.8, EFSA Journal 2010; 8 (7):1666)</p> <p>Stocking density issues was discussed in relation to the welfare of broilers, particularly - mortality, musculoskeletal disorder, thermal discomfort behaviour restrictions, environmental factors (see chapter 3, 3.1, 3.2, 3.6, 3.7, 3.8, EFSA Journal 2010; 8 (7):1666) Stocking density was one of the major risks identified in the risk assessment process. The major risk scores for likelihood of being exposed to a hazard that leads to poor</p>

ORGANISATION	CHAPTER_TEXT	COMMENTS_TEXT	COMMENTS_DEAL
		<p>Density (Kg/m<sup>2</sup>) 30.0, 34.0, 38.0, 42.0, and 46.0.  Birds with 0 Gait Score (%) 80.8, 74.2, 76.1, 68.0, and 61.1, respectively.  The impact of stocking rate on bird welfare is also worthy of discussion: Exceeding 20 birds/m<sup>2</sup> is likely to increase competition for floor space, feed and water (Hall, 2001). Hall (2001) also indicates that birds placed at above 19 birds/m<sup>2</sup> have higher 7d mortality, a higher number of daily leg culls, and are more behaviourally restricted.  References:  Defra. 2003. Stocking density and welfare in broilers. UK: Defra (AW0219). (Later published as: Dawkins, M. S., Donnelly, C.A., &amp; Jones, T.A. 2004. Chicken welfare is influenced more by housing conditions than by stocking density. <i>Nature</i>, 427:342-344).  Hall, A. 2001. The effect of stocking density on the welfare and behaviour of broiler chickens reared commercially. <i>Animal Welfare</i>, 10:23–40.  Haslam, S. 2005. Association between abattoir data and leg health and welfare of chickens. In: Defra, 2005. Review of On-Farm Poultry Welfare Research. 9 June 2005 London. Defra, 26-28  RSPCA. 2006. Everyone’s a winner. How rearing chickens to higher welfare standards can benefit the chicken, producer, retailer and consumer. UK: RSPCA.</p>	<p>welfare (welfare impact plus exposure to hazard) were: unbalanced body conformation, high stocking density, fast growth rate, low light intensity, and wet litter.’(see conclusions, EFSA Journal 2010; 8 (7):1666)</p>
<p>Department for Environment, Food and Rural Affairs</p>	<p>References</p>	<p>Line 2402: This study aimed to determine whether lame chickens were in chronic pain by comparing the ability of lame and ‘normal’ broilers to complete an obstacle course following administration of an analgesic (carprofen), a placebo saline injection or a control handling procedure. Lame birds were much slower to finish the obstacle than sound ones, unless they had received the analgesic. The latter birds completed the course in times that were closer to those of the ‘normal’ birds. This led McGeown et al. (1999) to conclude that “birds with moderate lameness suffer pain when they walk”. On the other hand, “Taken in isolation, the results of this study do not prove that broilers with a gait score of 3 suffer pain when they walk...however, when combined with behavioural evidence (Weeks and Kestin, 1997) and the results of self-selection studies (Danbury et al., 1997), they do provide good evidence that moderately lame birds, as defined by a gait score of 3, suffer pain when they walk”.</p>	<p>Information was taken into account, the text was modified and references included in the list (see chapter 3.2, 3.3, 3.4 and references, EFSA Journal 2010; 8 (7):1666)</p>

ORGANISATION	CHAPTER_TEXT	COMMENTS_TEXT	COMMENTS_DEAL
<p>Department for Environment, Food and Rural Affairs</p>	<p>7.4. Trait combination - selection indices</p>	<p>Comment: Defra's comments on the paper by Kestin et al., 1992. Prevalence of leg weakness in broiler chickens and its relationship with genotype. Vet. Record 131: 190-194.</p> <p>The authors studied samples of birds from 10 flocks (8 commercial, intensively reared and 2 free range) to evaluate leg health using a gait scoring system that they (Kestin et al., 1992) had devised. The bird's ability to walk was scored on a 6 point scale (i.e. 0-5), with a gait score (GS) of 0 signifying a 'normal' bird, a 3 indicating that the bird had an obvious gait defect that affected its movement, through to 5 where the bird was incapable of sustained walking on its feet, needing assistance from its wings or crawling on its shanks.</p> <p>The authors suggest that "there is likely to be chronic pain and discomfort associated with....gait scores of 3, 4 and 5". They also report that 26% of the commercial, intensively reared broilers suffered leg abnormalities of "sufficient severity for their welfare to be compromised", i.e., gait score 3 and above. However, these scores were obtained from a total of 1300 birds from 5 flocks. Therefore, this study was not a survey of UK broiler flocks.</p>	<p>Information was taken into account and text developed (see chapter 3.2, and 5.4, EFSA Journal 2010; 8 (7):1666)</p>



ORGANISATION	CHAPTER_TEXT	COMMENTS_TEXT	COMMENTS_DEAL
RSPCA	6.1. Mortality	<p>Section 6.1</p> <p>Line 1204: Omit ‘naturally’ as this indicates birds dying of natural causes, which may not be the case.</p> <p>Line 1209: Insert ‘necessarily’ before ‘direct’, as mortality can directly reflect welfare in some cases.</p> <p>Line 1209: Replace ‘impact welfare if’ with ‘be a good indicator of welfare especially when’. ‘Impact’ is not quite the right word here.</p> <p>Line 1209: Change ‘animal’ to ‘animals’.</p> <p>Line 1210: Is not only time of suffering, but also the intensity of suffering. The time it takes to die is irrelevant if the animal is not suffering, so this can be omitted.</p> <p>Line 1211: should include ‘poor health’ here, as disease and injury may not be broad enough to cover all welfare related conditions that result in culling.</p> <p>Line 1211 – 1212: This should not be ‘on the other hand’ it should be ‘however’.</p> <p>Line 1212: Replace ‘could’ with ‘can’. And, insert ‘good management practice as this may have been’ after ‘reflect’.</p> <p>Line 1213: Omit this line.</p> <p>Line 1218 - 1219: This sentence may be better expressed as, ‘Breeders that are either too young or too old often have poorer fertility and hatchability resulting in chicks that have increasing embryonic and early mortality.’</p> <p>Line 1220: change ‘chick’ to ‘chicks’. And insert ‘increased’ before ‘mortality’.</p> <p>Line 1221: Omit ‘increases’.</p> <p>Line 1225: Insert ‘an’ before ‘increase’.</p> <p>Line 1230: Should define the term ‘intensive’.</p> <p>Line 1231: Need to define what ‘ecological conditions’ is.</p> <p>Line 1232 – 1233: Omit ‘for the fattening period’ as there are no distinct rearing phases for chickens, as there are in pigs, for example.</p> <p>Line 1235 – 1238: State the values for the stocking densities, lighting periods and litter depths for each.</p> <p>Line 1239: Need to make this sentence clearer.</p> <p>Line 1248: Add the letter ‘s’ to ‘genetic’.</p> <p>Line 1253: Should be ‘(Hubbard/ISA)’.</p> <p>Line 1254: Add ‘the I957’ after ‘in’.</p> <p>Line 1257: Replace one of’ with ‘a’.</p> <p>Line 1258: Replace ‘with special “welfare”’ with ‘to higher welfare’.</p> <p>Line 1259: add ‘environmental enrichment items and a brighter lit environment’ to the list.</p>	<p>The technical comments were taken into account in further development of the opinion and text was modified. For editorial comments text was corrected accordingly (see chapter 3.1, EFSA Journal 2010; 8 (7):1666)</p>

ORGANISATION	CHAPTER_TEXT	COMMENTS_TEXT	COMMENTS_DEAL
		<p>Line 1263 - 1264: Last part of sentence would read better as, ‘however, some lines, such as the naked neck, appear resistant.’</p> <p>Line 1266: Add ‘fed’ after ‘restricted’.</p> <p>Line 1269: Should add a cautionary note here to state that although there may be benefits to welfare by restrictively feeding the birds, the practice of restrictive feeding itself may result in other welfare problems.</p>	<p>More information on feed restriction is presented in chapter 4.1, EFSA Journal 2010; 8 (7):1667) ‘Not restricting the feed will cause welfare problems because of the high body weight of non restricted standard birds including increased premature death. The degree and duration of feed restriction causes welfare problems associated with hunger. There is a lack of data on the effect of feed restriction in broiler breeder males as most research has been on females’</p>
<p>Department for Environment, Food and Rural Affairs</p>	<p>Glossary</p>	<p>Line 2629: Comment: Definition of “Dwarf gene”. Dwarf gene reduces weight and height.</p> <p>Comment: Lameness usually involves pain.</p>	<p>Comments were taken into account and text was reworded (see Glossary, EFSA Journal 2010; 8 (7):1667)</p>
<p>Department for Environment, Food and Rural Affairs</p>	<p>9.1. Indicators used in practice</p>	<p>Line 2042: Comment: Reference should be made to advances made by assurance schemes or any advances made in auditing broilers.</p>	<p>Information was taken into account and text developed (see chapter 4 EFSA Journal 2010; 8 (7):1666) and (chapter 5, EFSA Journal 2010; 8 (7):1667)</p>

ORGANISATION	CHAPTER_TEXT	COMMENTS_TEXT	COMMENTS_DEAL
Department for Environment, Food and Rural Affairs	7.6. Policies of breeding companies regarding selection for welfare versus production	Line 1920 Comment: The symbol for less than 0.4 would be better explained in writing.	Explanation was added (see chapter 5.6 EFSA Journal 2010; 8 (7):1666)
Department for Environment, Food and Rural Affairs	7.4. Trait combination - selection indices	Line 1851 Change required: Change “suffered” to “had”. Line 1852 Change required: Change “abnormalities leading to gate scores > 3” to “abnormalities leading to gate scores = 3” Justification: 26 per cent of birds represented by this survey had a gait score of 3 or above and not above 3. Line 1854 Change required: Change “abnormalities leading to gate scores > 3” to “abnormalities leading to gate scores = 3” Justification: 27.6 per cent of birds represented by this survey had a gait score of 3 or above and not above 3.	Information was taken into account and corrections inserted (see chapter 5.4 EFSA Journal 2010; 8 (7):1666)
Department for Environment, Food and Rural Affairs	6. Overview of the welfare of broilers	Line 1182 Comment: Reference should be made to Dawkins et al. 2004 Chicken welfare is influenced more by housing conditions than by stocking density. NATURE   VOL 427   22 JANUARY 2004. The paper found that management factors were a major factor in bird welfare. No observations are made on bird behaviour.	The information was taken into account and reference to was added (see chapter 3.8 EFSA Journal 2010; 8 (7):1666)
Department for Environment, Food and Rural Affairs	5.14. Infectious diseases	Line 1102 Change required: replace “waiting times” with “withdrawal periods”.	The information was is taken into account and text was changed accordingly see (see chapter 4.15, EFSA Journal 2010; 8 (7):1667)
Department for Environment, Food and Rural Affairs	5.13. Training of stockpersons	Line 1090 Comment: There is no reference to training regulations mentioned in 2007/43/EC (laying down minimum rules for the protection of chickens kept for meat production)	The issues of training is addressed in chapter 4.18 (EFSA Journal 2010; 8 (7):1667)
Department for Environment, Food and Rural Affairs	5.7. Culling	Line 1016 Comment: Culling can be mitigated by good practice and a regular inspection which requires keepers to walk 3 meters of every bird and encourage it to move, taking care not to frighten the birds with sudden, unaccustomed movement, noise or changes in light levels. The aim should be to pass close enough to the birds to see them clearly and for them to be disturbed and so move away. This should enable the identification of any	The items of culling methods are addressed in chapter 3.1 (EFSA Journal 2010; 8 (7):1666) and chapter 3.5 and 3.7 (EFSA

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		individual that is sick, injured or weak. Source: <a href="http://defraweb/foodfarm/farmanimal/welfare/onfarm/documents/meatchkscode.pdf">http://defraweb/foodfarm/farmanimal/welfare/onfarm/documents/meatchkscode.pdf</a> (also submitted to EFSA in October 2009).	Journal 2010; 8 (7):1667) The item of culling practices linked to the mortality is presented in chapter 3.9 (EFSA Journal 2010; 8 (7):1667) and the mortality to poor management of the birds is presented in chapter 3.1. (EFSA Journal 2010; 8 (7):1666)
Department for Environment, Food and Rural Affairs	5.4. Environmental enrichment	Line 961 and 966 Comment: Contradictory statements in line 961 and 966. There is no mention about damage perches can do to chickens.	Text was reworded and potential problems of inadequate perches and frequent use of perches are presented in chapter 4.4 (EFSA Journal 2010; 8 (7):1667)
Department for Environment, Food and Rural Affairs	5.3. Mutilations	Line 908: Change required: "...and may possibly become a source of chronic pain." Justification: What is the evidence that suggests neuromas are a source of chronic pain?	The information was is taken into account and text was to : "... neuromas may be formed and may become a source of chronic pain. (see chapter 4.3.1 (EFSA Journal 2010; 8 (7):1667)
Department for Environment, Food and Rural Affairs	5.1. Feed restriction	Line 845 Comment: Defra (2005) report mentioned here is not listed in the reference list.  Line 849 Comment: We challenge the statement that chemical suppressants may not be acceptable to consumers or farmers. What is the evidence that supports this?	Reference was added to the list (see References EFSA Journal 2010; 8 (7):1667) Supporting reference as added (Hocking and Bernard, 1993)' see chapter 4.1 (EFSA Journal 2010; 8 (7):1667)
Department for Environment, Food and Rural Affairs	4.6. Transport issues	Line 693 Comment: A reference is given to a Council of Europe (NOR (90)6), however the reference is not listed in the reference list.	Reference was added to the list (see References EFSA Journal 2010; 8 (7):1667)

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Department for Environment, Food and Rural Affairs	4.5. Culling methods	Line 669 Change required: Reference should be made to percussive killing device as a method of killing not only as a stunning method.	The information was taken into account and text amended as ‘A percussive blow to the head may also be used to kill and not only to stun a bird’ (see chapter 3.5, EFSA Journal 2010; 8 (7):1667)
Department for Environment, Food and Rural Affairs	4.4.2. Management during the production period	Line 564 Change required: “Stockpersons keep records of the hybrids...” Justification: Hybrids should be plural as hybrid of cocks is different.	Text was amended as ‘ Stockpersons keep records of the number of birds..’ (see chapter 3.4.2, EFSA Journal 2010; 8 (7):1667)
Department for Environment, Food and Rural Affairs	4.3.2. Management during the rearing period	Line number 438 Change required: Insert: .....and chemical appetite suppressant... Justification: to be consistent with line 846. The above statement is supported by Defra sponsored research (Defra funded project AW1130 which was sent to EFSA in October).  Line number 456 and 539 It is not clear who is recommending “the maximum feed distribution time for track feeders”.	Text was amended as ‘Scientific experiments have evaluated various types of diets, including 525 „appetite suppressants”...’ (see chapter 3.3.2.4 EFSA Journal 2010; 8 (7):1667)  Explanation was added: In general, parent stock management manuals supplied by the breeding companies are used as guidelines when constructing houses or establishing management practices for breeder flocks (See chapter 3 EFSA Journal 2010; 8 (7):1667)

ORGANISATION	CHAPTER_TEXT	COMMENTS_TEXT	COMMENTS_DEAL
Department for Environment, Food and Rural Affairs	4. Housing and management of broiler breeders (parents and grandparents)	Housing and management of broiler breeders (parents and grandparents) Page 9. Footnote The statement is correct however, we would like the Commission to be aware that we have issued a consultation on the Code for the welfare of meat chickens and breeding chickens.. <a href="http://defraweb/foodfarm/farmanimal/welfare/onfarm/documents/meatchkcode.pdf">http://defraweb/foodfarm/farmanimal/welfare/onfarm/documents/meatchkcode.pdf</a>	The report is available online.
Department for Environment, Food and Rural Affairs	1. Introduction	Line number 217: Change required: Delete “with subsequent welfare problem (Bessei, 2006). Justification: references to Bessai (2006) in line 217 and 221 are contradictory.	The information was taken into account and text amended (See chapter 3 EFSA Journal 2010; 8 (7):1667)
RSPCA	6. Overview of the welfare of broilers	Line 1192: insert the word ‘and’ before ‘barren’. Line 1194: could remove the word ‘animal’ or replace with ‘chicken’ or ‘bird’. Line 1201: insert the word ‘fast’ before ‘early’.	The information was taken into account and text amended (See chapter 3 EFSA Journal 2010; 8 (7):1667)
RSPCA	5.14. Infectious diseases	Line 1103: Replace ‘herds’ with ‘flocks’. Line 1124: Would be good to have a little more information on the cause of tendon rupture.	Correction was done (See chapter 4.15 EFSA Journal 2010; 8 (7):1667) The cause is unknown. (See chapter 4.12 EFSA Journal 2010; 8 (7):1667)
RSPCA	5.12. Metabolic disorders	Line 1087: Could the impact of SDS on welfare be expanded on here and other metabolic disorders listed?  Line 1087: Should ‘breeders’ read ‘breeder’.	The original text was kept, and only technical correction was done: ‘Metabolic disorders such as sudden death syndrome (SDS) are observed in broiler breeder hens and are probably due to hypocalcaemia or hypokalaemia (Julian, 2005).’ (See chapter 4.14 EFSA Journal 2010; 8 (7):1667)

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RSPCA	5.11. Egg peritonitis/Salpingitis in females	<p>Line 1082: Change the word 'in' to 'is'.</p> <p>Line 1084 – 1085: It is mentioned that egg peritonitis is not a serious problem. Does this mean it is not a serious welfare problem, or that it is not a serious problem in terms of its prevalence? Would it be possible to clarify. I assume it means it's not a serious problem in terms of its prevalence as line 1082 states that this disorder can cause death.</p>	<p>A correction was done and clarification was added: 'It was said not to be a common problem in SCAHAW report 2000 but it is serious for those that have it and it can reach 1-15 % from the 24th week of life. (See chapter 4.13 EFSA Journal 2010; 8 (7):1667)</p>
RSPCA	5.10. Leg weakness	<p>Line 1069: Change the word 'these' to 'those'.</p>	<p>Change was done (See chapter 4.12 EFSA Journal 2010; 8 (7):1667)</p>
RSPCA	5.9. Cage housing	<p>Line 1058 – 1059: I think this is meant to highlight the value birds place on the provision of litter, but it also suggests that the provision of litter offers a solution to the stress caused by feed restriction. I do not believe this is the case, therefore can this sentence be amended.</p>	<p>Rewording of '.. high value birds place on the provision of litter' was but the information 'Making litter available again diminished the effects of stress due to feed restriction' was decided to be kept (See chapter 4.11 EFSA Journal 2010; 8 (7):1667)</p>
Compassion in World Farming	7. Genetic selection of broilers	<p>Selection for rapid growth and feed conversion efficiency is clearly one of the main causes of poor welfare in commercial broiler birds. A comprehensive review of broiler welfare (Bessei, 2006) concludes that slower-growing breeds have fewer leg problems, fewer incidence of metabolic diseases and lower mortality levels than birds bred for fast growth. Below are listed some of the key scientific papers providing strong evidence that the main welfare problems existing in commercial broiler production – i.e. leg disorders, heart failure, and behavioural problems - are a direct consequence of genetic selection for faster growth.</p> <p>The scientific literature makes it clear that while changes in management and husbandry can reduce the incidence of leg disorders, genetics have a much greater impact on the level of leg disorders than husbandry and management. Kestin et al (1999) found that there was a difference of over 0.5 gait score units between two of the broiler strains that they examined, even though the weight of the birds was the same. This comparatively</p>	<p>The information was taken into account. The topics are addressed in the specific chapters of the opinion and in the Conclusions: 'The major welfare concerns for broilers are leg problems, contact dermatitis, especially footpad dermatitis, ascites and sudden death syndrome. These concerns have been exacerbated by genetic selection for fast growth and</p>

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		<p>large difference was due to genetics alone, whereas changes in husbandry and management have been shown to make only small improvements to leg problems. Whitehead et al (2003) assert that “there is no doubt that the rapid growth rate of birds used for meat production is the fundamental cause of skeletal disorders, nor that this situation has been brought about by the commercial selection programmes”.</p> <p>There is wide evidence that selection for fast growth rate is an important factor leading to lameness in broilers (Knowles et al., 2008, Kestin et al., 2001, Kestin et al., 1999, Sørensen et al 1999).</p> <p>The SCAHAW report (2000) supports the view that the broiler breeding companies could undoubtedly improve the welfare of broilers by selecting for improved leg strength and walking ability and by reversing the trend towards faster growth rates. As quoted in this report, Hardiman (1996) found that selection against leg disorders was the ninth of 12 factors taken into account by the breeders of broilers, well behind growth rate and feed conversion efficiency. This is despite the fact that faster growth rates and higher liveweights have been identified as the most important factors in the development of leg disorders (Kestin et al, 2001; Knowles et al, 2008).</p> <p>Bessei, W., 2006. Welfare of broilers: a review. World’s Poultry Science Journal, 62: 455-466.</p> <p>Kestin, S. C., Su, G., Sørensen, P., 1999. Different commercial broiler crosses have different susceptibilities to leg weakness. Poultry Science 78: 1085-1090.</p> <p>Kestin, S. C., Gordon, S., Su, G., Sørensen, P., 2001. Relationships in broiler chickens between lameness, liveweight, growth rate and age. Veterinary Record 148: 195-197.</p> <p>Knowles, T. G., Kestin, S. C., Haslam, S. M., Brown, S. N., Green, L. E., Butterworth, A., Pope, S. J., Pfeiffer, D. and Nicol, C. J., 2008. Leg disorders in broiler chickens: prevalence, risk factors and prevention. Plos one 3 (2): e1545. doi: 10.1371/journal.pone.0001545.</p> <p>Scientific Committee on Animal Health and Animal Welfare (SCAHAW), 2000. The Sørensen, P., Su, G., Kestin, S. C., 1999.</p> <p>Whitehead, C. C., Fleming, R. H., Julian, R. J., Sørensen, P., 2003. Skeletal problems associated with selection for increased production. In: CAB International. Poultry Genetics, Breeding and Biotechnology. Eds: W.M. Muir and S.E. Aggrey p29-52.</p>	<p>more efficient food conversion.’ (See EFSA Journal 2010; 8 (7):1666)</p> <p>Most of the proposed articles and authors are cited and listed in the opinion (See EFSA Journal 2010; 8 (7):1666)</p>



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Compassion in World Farming	6.9. Environmental factors linked to welfare problems	<p>Selective breeding for faster growth rate and feed conversion efficiency has caused most of the welfare problems broilers suffer from today. Taking into account welfare aspects in the selection scheme would be an important step forward to improve the welfare of commercial broiler chickens. However, housing system and management practices are also determinant factors that directly affect broiler welfare.</p> <p>High stocking density in broiler sheds restricts the broiler chickens' natural behaviour and is associated with increases in lameness, breast blisters, foot-pad dermatitis, hock burns and infections. It also leads to poor litter quality, increased air pollution from ammonia and poor temperature and humidity control, all of which damage the birds health and welfare.</p> <p>The barren environment of commercial broiler houses also contributes to inactivity. Providing broilers with environmental enrichment such as straw bales and perches can significantly increase the amount of time the broilers spend standing, walking and running and reduce the amount of time spent sitting and resting (Kells et al, 2001). This can in turn reduce leg problems and hock burns or breast blisters from prolonged sitting or lying on their litter material.</p> <p>Kells, A., Dawkins, M.S. and Cortina Borja, M., 2001. The effect of a 'freedom food' enrichment on the behaviour of broilers on commercial farms. <i>Animal Welfare</i> 10: 347 - 356.</p>	<p>The information was taken into account and text modified 'Environmental factors can reduce and increase bird welfare and so should be managed carefully'(See chapter 3.9 EFSA Journal 2010; 8 (7):1666)</p> <p>High stocking density was identified in the group of the major risk scores for likelihood of being exposed to a hazard that leads to poor welfare (welfare impact plus exposure to hazard) (See Conclusions EFSA Journal 2010; 8 (7):1666)</p> <p>It was considered that other environmental factors such as barren environment may also contribute to low levels of activity and may restrict the birds' behavioural repertoire'</p> <p>For the time of broilers spend standing was presented that '... broilers may spontaneously limit their physical efforts at the end of the rearing period even if space is available' and that 'motivation is the dominant determinative factor for walking in birds with a low body weight,</p>

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			<p>while physical ability is the dominant determinative factor for walking in birds with a high body weight.’ (See chapter 3.8 EFSA Journal 2010; 8 (7):1666)</p>
Compassion in World Farming	6.8. Behavioural restriction	<p>In a review paper on behaviour problems associated with selection for increased production, Kjaer and Mench (2003) concluded from the evidence gathered that “the strong selection for improved growth has brought about changes that seem to reduce birds’ adaptability. This has resulted in a range of behavioural problems that reduce well-being. Meat-type birds suffer from reduced behavioural activity, skeletal disorders, hock burn and footpad necrosis causing pain and suffering.”</p> <p>Reduced activity in commercial broilers is another side effect of intense selection for fast growth and feed efficiency. Weeks et al (2000) observed the activity of 6 batches of 100 commercially-reared broilers taken from different farms over a period of 2 years. Between 5 1/2 and 7 weeks of age, lame broilers spent 86% of their time lying down (compared to 76% for non-lame broilers). The lamest birds only spent 1.5% of their time walking, made significantly fewer trips to the food and water and even lay down to eat. The scientists conclude that as a result of selective breeding for efficient feed conversion, broilers have become ‘extremely inactive’ and that this may be detrimental to their welfare.</p> <p>All welfare issues associated with selection for fast growth listed above are likely to be associated with considerable pain in broilers. Research so far has primarily focused on the pain associated with leg disorders in broilers.</p> <p>Kjaer, J. B., and Mench, J. A., 2003. Behaviour problems associated with selection for increased production. In: CAB International. Poultry Genetics, Breeding and Biotechnology. Eds: W.M. Muir and S.E. Aggrey p.67-82.</p> <p>Weeks, C. A., Danbury, T. D., Davies, H. C., Hunt, P., Kestin, S. C., 2000. The behaviour of broiler chickens and its modification by lameness. Applied Animal Behaviour Science 67: 111-125.</p>	<p>‘Some result suggested that broilers may spontaneously limit their physical efforts at the end of the rearing period even if space is available’ and that ‘motivation is the dominant determinative factor for walking in birds with a low body weight, while physical ability is the dominant determinative factor for walking in birds with a high body weight.’ (See chapter 3.8 EFSA Journal 2010; 8 (7):1666)</p> <p>Gait abnormality does not always indicate pain and suffering, although it does indicate some degree of poor welfare for the bird because of difficulty in obtaining resources or interacting socially. (See Conclusions EFSA Journal 2010; 8 (7):1666)</p>

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Compassion in World Farming	6.5. Ascites, pericarditis, sudden death syndrome and spiking mortality syndrome	<p>Fast-growing broilers suffer from heart failure. The broiler selectively bred and managed for very fast growth has a genetically induced mismatch between its energy supplying organs and its energy consuming organs, according to research cited by SCAHAW (SCAHAW, 2000). SCAHAW concludes that: “Fast growth rates increase the risk of ascites and Sudden Death Syndrom (SDS) by increased oxygen demand of the broilers, which intensifies the activity of the cardiopulmonary systems.” (SCAHAW, 2000). According to Scheele et al (1997), a primary reason for the increased incidence in ascites is the focus in selection on growth, weight and feed conversion, which has lead to some neglect of the maintenance needs of the birds. Similarly, Grashorn (1993) suggested that selection for high growth rate has increased the risk for SDS.</p> <p>A recent Dutch survey of the future of the broiler industry recommended a move towards broilers “that have been bred less for high growth rates and feed conversions, and possibly, because of that, are less susceptible to heart and vascular problems” (van Harn and van Middelkoop, 2001).</p> <p>Grashorn M. A., 1993. Untersuchungen zur Ätiologie und Pathogenese des plötzlichen Herztods bei Masthühnern. Eugen Ulmer GmbH &amp; Co.(ed.) Stuttgart.</p> <p>Scheele, C. W., Kwakernaak, C., van der Klis, J. D., 1997. The increase of metabolic disorders in poultry affecting health, stress and welfare. In: P. Koene and H.J. Blokhuis (eds.), Proceedings of the Fifth European Symposium on Poultry Welfare 1997. Wageningen Agricultural University and the Institute of Animal science and Health, Netherlands: 26-28.</p> <p>van Harn, J., van Middelkoop, K., 2001. Is there a future for slow growing broilers? World Poultry 17 (8): 28-29.</p>	The information was taken into account and issues discussed entirely in chapter 3.5. (EFSA Journal 2010; 8 (7):1666)
Compassion in World Farming	6.2. Skeletal disorders	<p>A number of scientific studies have shown that compared with fast-growing chickens, slow-growing chickens have:</p> <ul style="list-style-type: none"> <li>• Five times less lameness (Bassler et al, 2005) and less severe lameness problems (McNamee and Smyth, 2000)</li> <li>• Up to 10 times less inflammation of the foot (Bassler et al, 2005)</li> <li>• Less bone degeneration that becomes infected with bacteria (McNamee and Smyth, 2000)</li> <li>• Stronger bones that are 15% less porous (Williams et al, 2000)</li> <li>• No tendon degeneration compared with an occurrence of 22% in fast growers (Bokkers and Koene, 2003)</li> <li>• No twisted legs compared with an occurrence of 10% in fast growers (Bokkers and Koene, 2003)</li> </ul>	The information was taken into account and issues discussed entirely in chapter 3.2 (EFSA Journal 2010; 8 (7):1666) There are serious welfare concerns over skeletal disorders in chickens. High gait scores have been associated with fast growth rates However, there is considerable variation in the reported

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		<ul style="list-style-type: none"> <li>• Lower levels of leg cartilage deformation with an occurrence of 1.2% compared with 47.5% in fast growers (Havenstein et al, 1994)</li> <li>• Lower levels of curvature of the spine with an occurrence of 2% compared with 19.5% in fast growers (Bokkers and Koene, 2003)</li> </ul> <p>As indicated above, a recent large-scale UK study into leg disorders found that 27.6% of the chickens had gait scores of 3 or more, i.e. lameness that is likely to be painful. (Knowles et al, 2008).</p> <p>The figure of 27.6% of broilers having gait scores of 3 or more is broadly similar to a Danish study that found 31.1% to have gait scores of 3 or more (Sanotra et al, 2001) and a Swedish study that found 20.4% to have such scores (Sanotra and Berg, 2003). The 2008 figure of 27.6% is almost identical to the results of a 1992 UK study that found almost 26% of broilers to have gait scores of 3 or more (Kestin et al, 1992). This suggests that there has been little improvement in the last 15 years.</p> <p>Bassler, A. W., Berg, C., Elwinger, K., 2005. Broilers in floorless pens on pasture. IV Effects on the conditions of the birds' legs and feet. A W Bassler. Organic Broilers in Floorless Pens on Pasture. Doctoral Thesis No 2005:67. Swedish University of Agricultural Sciences.</p> <p>Bokkers, E. A. M. Koene, P., 2003. Behaviour of fast- and slow growing broilers to 12 weeks of age and the physical consequences. Applied Animal Behaviour Science 81: 59-72.</p> <p>Kestin, S. C., Knowles, T. G., Tinch, A. E., Gregory, N. G., 1992. Prevalence of leg weakness in broiler chickens and its relationship with genotype. Veterinary Record, 131: 190-194.</p> <p>Knowles, T. G., Kestin, S. C., Haslam, S. M., Brown, S. N., Green, L. E., Butterworth, A., Pope, S. J., Pfeiffer, D. and Nicol, C. J., 2008. Leg disorders in broiler chickens: prevalence, risk factors and prevention. Plos one 3 (2): e1545. doi: 10.1371/journal.pone.0001545.</p> <p>McNamee, P. T., Smyth, J. A., 2000. Bacterial Chondronecrosis with osteomyelitis ('femoral head necrosis') of broiler chickens: a review. Avian Pathology 29: 253-270.</p> <p>Havenstein, G. B., Ferket, P. R., Scheideler, S. E., Larson, B. T., 1994. Growth, livability, and feed conversion of 1957 vs 1991 broilers when fed typical 1957 and 1991 broiler diets. Poultry Science 73: 1785-1794.</p> <p>Sanotra G.S. and Berg C., 2003. Investigation of lameness in the commercial production</p>	<p>figures due to a variety of genotypes management factors, the age at scoring, and the scoring system used.(see chapter 3.2 EFSA Journal 2010; 8 (7):1666</p> <p>Suggested articles and authors were considered and most of them are quoted and listed in the references list (EFSA Journal 2010; 8 (7):1666)</p>

ORGANISATION	CHAPTER_TEXT	COMMENTS_TEXT	COMMENTS_DEAL
		<p>of broiler chickens in Sweden. Swedish University of Agricultural Sciences. Specialarbete 22. Skara 2003.</p> <p>Sanotra G.S., Lund J.D., Ersboll A.K., Petersen J.S. and Vestergaard K.S., 2001. Monitoring leg problems in broilers: a survey of commercial broiler production in Denmark. World's Poultry Science Journal 57: 55–69.</p> <p>Williams B., Solomon, S., Waddington D., Thorp B., Farquarson, C., 2000. Skeletal development in the meat-type chicken. British Poultry Science 41: 141-149.</p>	
Compassion in World Farming	5.14. Infectious diseases	<p>There is evidence that the selection of broilers for rapid growth and efficient feed conversion has reduced their immunity to disease. Broilers selected for fast growth rate have been found to have lower antibody responses when exposed to infection, according to a review by Rauw et al (1998). An experiment on the immune responses of different broiler strains in Israel found that 40% of the fast growing, heavier broilers died when infected with Escherichia coli bacteria, compared to 8% - 20% mortality for slower-growing breeds. The scientists commented that “these results indicate that rapid growth rate substantially reduces broiler viability” (Yunis et al, 2002).</p> <p>Fast growth rates are believed to be related also to high incidence of cellulitis (a disease caused by bacteria such as E.coli) in modern broiler farms. In addition, broilers selected for fast growth have been found to have increased susceptibility to various non-infectious diseases (Boersma, 2001).</p> <p>Boersma, S., 2001. Managing rapid growth rate in broilers. World Poultry 17 (8): 28-29.</p> <p>Yunis, R., Ben-David, A., Heller, E. D., Cahaner, A., 2002. Antibody responses and morbidity following infection with infectious bronchitis virus and challenge with Escherichia coli, in lines divergently selected on antibody response. Poultry Science 81: 149-159.</p>	The chapter address this topic in broiler breeders flocks ‘...in general, infectious disease is not a major cause of mortality in broiler breeders. (see chapter 4.15 EFSA Journal 2010; 8 (7):1667)

ORGANISATION	CHAPTER_TEXT	COMMENTS_TEXT	COMMENTS_DEAL
Compassion in World Farming	5.3. Mutilations	<p>Beak trimming of broiler breeder male chicks is common in order to reduce the risk of damage due to aggressive pecking when birds are older, especially to protect females during mating. As the chickens' beaks, toes and combs have a rich nerve supply, it is highly likely that all these mutilations cause acute or short term-pain at the time of procedure. Some operations such as beak-trimming can have longer term or chronic impacts on welfare (see review by Duncan and Forkman, 2006). The beak trimming of growing birds using a traditional hot blade results in chronic pain, as the severed nerves grow back into the damaged stump and form neuromas that continue to send pain signals back to the brain (Breward and Gentle, 1985). According to FAWC (1998), beak trimming is a most undesirable mutilation which should be avoided, if at all possible. Breeding companies must be urged to find a genetic solution to the problem of injurious pecking. Male birds are usually de-spurred. This involves removal of the spur bud, that is found further up the back of the leg, using a heated wire. This procedure is likely to cause pain. One of the main breeding companies has developed a strain that has short blunt spurs that do not damage the females. Routine de-spurring should not be necessary and other companies should be urged to develop similar strains (FAWC, 1998). Some parts of the industry remove the dew and pivot claw from the feet of males using sharp scissors. The last digits of the rear toes are also frequently removed and sometimes the last digit of the inner toes on each foot. A special toe trimmer is used for these operations. There is evidence that these operations cause acute pain but with less longer-term pain than with beak trimming (Gentle and Hunter, 1988). It has been shown that toe clipping in turkeys increases mortality and reduces growth (Owings et al, 1972). This indicates that longer term welfare is affected by the procedure. Toe clipping may also interfere with scratching during foraging and cause problems with balance. As advised by FAWC in 1998, the industry should adopt management strategies that avoid the need for de-clawing such as reducing the ratio of males. A procedure called 'dubbing' is also carried out in most parts of the world. This is where part of the comb on the male chick's head is removed using sharp scissors. The comb contains a rich nerve supply and it is almost certain that the procedure causes acute pain. However, dubbing may cause social problems later in life because combs are used in individual recognition (Guhl and Ortman, 1953). Dubbing was originally carried out to reduce the risk of damage to the comb caused by other birds and the environment. Most of these risks have now been eliminated and the procedure seems to continue out of habit. Breeding companies should be encouraged to educate their customers that the practice is not necessary (FAWC, 1998).</p>	<p>The information was taken into account and issues discussed in chapter 4.3. (EFSA Journal 2010; 8 (7):1667)</p> <p>'Sometimes mutilations have become routine for traditional reasons and may no longer be required. The extent to which each mutilation, and the methods used, is carried out in EU member states is not known. Because of its implications for welfare, data on the prevalence of beak trimming, de-toeing and de-spurring and the methods used should be collected as well as studies for their need.'</p> <p>See chapter 4.3. (EFSA Journal 2010; 8 (7):1667)</p>

ORGANISATION	CHAPTER_TEXT	COMMENTS_TEXT	COMMENTS_DEAL
Compassion in World Farming	5.1. Feed restriction	<p>According to SCAHAW (2000), severe feed restriction results in unacceptable welfare problems and these have to be improved. New approaches to the breeding and management of broiler parent stock are needed so that both the period and severity of feed restriction can be reduced considerably without adverse welfare consequences. If broiler breeders are fed ad libitum, they show an increased incidence of leg weakness, deformity and tissue damage (Hocking and Duff, 1989; Katanbaf et al, 1989; Hocking et al, 1993; Savory et al, 1993; Iqbal et al, 2000). In addition, they show reduced antibody response, reduced disease resistance and increased mortality (Han and Smyth, 1972). Alternatively, if broiler breeders are feed restricted, they are chronically hungry, frustrated and stressed (Savory et al, 1993). Several studies have demonstrated that feed restriction results in stress as measured by a number of physiological indicators found in the blood (Katanbaf et al, 1989; Savory et al, 1992; 1993; Savory and Maros, 1993; Hocking et al, 1996; 2001). For instance, feed restriction increases circulating glucocorticoids such as corticosterone (Mench, 1991; Hocking et al, 1993). These measures have been shown to correlate positively with the level of restriction imposed (Hocking et al, 1996).</p> <p>Several authors have also reported that feed restriction causes suppression of the immune system in broiler breeders (Hocking, 1993; Savory, 1993). Feed restriction may be particularly stressful for young birds because of the demand for high growth. Food restricted broiler breeders develop abnormal behaviours as a result of frustration (Mench, 2002). The most common of these is stereotypic pecking at objects in their pen such as walls and drinkers (Dawkins, 1990; Savory et al, 1992). Stereotypic behaviour is generally excessive, directed at inappropriate objects and serves no obvious function. Levels of stereotypies have been shown to be positively correlated with the amount of food restriction (Savory and Maros, 1993).</p> <p>Dawkins, M. S., 1990. From an animal's point of view: motivation, fitness and animal welfare. <i>Behavioural and Brain Sciences</i>, 13: 1-61.</p> <p>Han, P. F. S., Smith, J. R., 1972. The influence of restricted feed intake on the response of chickens to Marek's disease. <i>Poultry Science</i> 51:986-990.</p> <p>Hocking, P. M., Maxwell, M. H., Mitchell, M. A., 1996. Relationships between the degree of food restriction and welfare indices in broiler breeder females. <i>British Poultry Science</i> 37: 263-278.</p> <p>Hocking P. M., Maxwell, M. H., Robertson, G.W., Mitchell, M. A., 2001. Welfare assessment of modified rearing programmes for broiler breeders. <i>British Poultry Science</i> 42 (4): 424-432.</p>	<p>The text was developed on the base of more recent studies and took into account commented topics.</p> <p>'There is a genetic component as the degree of restriction necessary e.g. for mini-breeders it is lower than for standard broiler breeders. The degree of restriction has been increasing over the past few decades in response to selection for higher growth rates. Not restricting the feed will cause welfare problems because of the high body weights of non-restricted standard birds including increased premature death. The degree and duration of feed restriction causes welfare problems associated with hunger. There is a lack of data on the effect of feed restriction in broiler breeder males as most research has been on females Alternative feeding strategies, like diet dilution and appetite suppressants, do not clearly benefit broiler breeder welfare The trend in the degree of feed restriction required to maintain broiler breeder bodyweight targets</p>

ORGANISATION	CHAPTER_TEXT	COMMENTS_TEXT	COMMENTS_DEAL
		<p>Iqbal M., Kenney, P. B., Al-Humadi N. H., Klandorf H., 2000. Relationship between mechanical properties and pentosidine in tendon: effects of age, diet restriction and aminoguanadine in broiler breeder hens. <i>Poultry Science</i> 79:1338-1344.</p> <p>Katanbaf, A. M., Dunnington, E. A. and Siegel, P. B., 1989. Restricted feeding in early and late-feathering chickens. 1. Growth and physiological responses. <i>Poultry Science</i> 68: 344-351.</p> <p>Mench, J. A., 2002. Broiler breeders: feed restriction and welfare. <i>World Poultry Science Journal</i> 58: 23-29.</p> <p>Savory, C. J., Maros, K., Rutter, S. M., 1993. Assessment of hunger in growing broiler breeders in relation to a commercial restricted feeding programme. <i>Animal Welfare</i> 2: 131-152.</p> <p>Savory, C. J., Maros, K., 1993. Influence of degree of food restriction, age and time of day on behaviour of broiler breeder chickens. <i>Behavioural Processes</i> 29: 179-190.</p> <p>Scientific Committee on Animal Health and Animal Welfare (SCAHAW), 2000.</p>	<p>should be monitored.’ (See chapter 4.1, EFSA Journal 2010; 8 (7):1667)</p>
Compassion in World Farming	4.3.2. Management during the rearing period	<p>Several husbandry practices can affect the health and welfare of broiler breeders. These especially include stocking density which also indirectly affects other factors such as temperature, humidity and the quality of the litter and the air. Keeping stocking densities low is important for reducing the build up of droppings and moisture that can lead to foot and hock burns. Foot and hock burns in turn reduce walking activity because they make walking painful (Su, Sørensen and Kestin, 2000). SCAHAW concluded that contact dermatitis is a ‘relatively widespread’ problem which can affect many of the birds in some flocks, and that it is associated with crowding, restricted movement, leg weakness and poor litter quality (SCAHAW, 2000).</p> <p>Air quality is an important management factor as high concentrations of ammonia in the shed can damage the birds’ health and welfare. High levels of ammonia are aversive to broiler birds, as shown by Jones et al (2005): “broiler fowl avoid ammonia at concentrations commonly found on poultry units.... suggesting it to be aversive at concentrations above approximately 10ppm.” Although stocking densities are usually lower in breeders sheds, ammonia levels should be carefully monitored to ensure air quality.</p> <p>Daylength and light intensity are also important for both welfare and reproductive development of broiler breeders. Low light levels reduce all activity and can lead to eye damage. There is a concern that some producers, as a precautionary measure to reduce the risk of aggression, routinely keep light levels as low as 2-3 lux. According to FAWC (1998), if aggression occurs, the lights should only be dimmed for a few days.</p> <p>Rearing houses are relatively barren and do not encourage the birds to perform natural</p>	<p>‘In most countries the stocking density of broiler breeder flocks during rearing is not limited by legislation. Instead, the parent stock management manuals supplied by the breeding companies are used as a guideline when stocking density is to be decided. Stocking density during the rearing and production period may vary considerably between farms and countries. There is no literature available on the effect of stocking density on broiler breeder welfare, although the effect of stocking density on behaviour, injuries and zootechnical performance in</p>



ORGANISATION	CHAPTER_TEXT	COMMENTS_TEXT	COMMENTS_DEAL
		<p>behaviour. In their report on the welfare of broiler breeders, FAWC (1998) recommends that environmental enrichment, such as the provision of perches and the scattering of grit on the litter, should be available in rearing poultry houses.</p> <p>Farm Animal Welfare Council (FAWC), 1998. Report on the welfare of broiler breeds. FAWC Surbiton, UK.</p> <p>Jones, E. K. M., Wathes, C. M., Webster, A. J. F., 2005. Avoidance of atmospheric ammonia by domestic fowl and the effect of early experience. <i>Applied Animal Behaviour Science</i> 90 (3/4): 293-308.</p> <p>Scientific Committee on Animal Health and Animal Welfare (SCAHAW), 2000. The Welfare of Chickens Kept for Meat Production (Broilers). European Commission, Health and Consumer Protection Directorate-General, March 2000.</p> <p>Sørensen, P., Su, G., Kestin, S. C., 1999. The Effect of Photoperiod:Scotoperiod on Leg Weakness in Broiler Chickens. <i>Poultry Science</i> 78: 336–342.</p>	<p>broiler breeders during rearing and production is currently under study.</p> <p>There is no literature about the relationship between light intensity and feather pecking in broiler breeders or about the prevalence of serious outbreaks of feather pecking in broiler breeder flocks. The prevalence of contact dermatitis in broiler breeders is not known. The prevalence of footpad lesions, breast blisters and hock burns for broiler breeders should be determined using the methods established for broilers. Systematic recording could be considered to monitor trends'. See chapter 3.3.2, 4.5, 4.6, 4.7, EFSA Journal 2010; 8 (7):1667)</p>
Compassion in World Farming	4.2. Mutilations	<p>The SCAHAW report condemns the mutilations (de-beaking, dubbing, de-spurring, de-clawing, toe-removal) commonly carried out on broiler breeder chicks and stresses that the birds should be kept in such a manner that mutilations are not necessary.</p> <p>As the chickens' beaks, toes and combs have a rich nerve supply, it is highly likely that all these mutilations cause acute or short term-pain at the time of procedure. Some operations such as beak-trimming can have longer term or chronic impacts on welfare (see review by Duncan and Forkman, 2006). The beak trimming of growing birds using a traditional hot blade results in chronic pain, as the severed nerves grow back into the damaged stump and form neuromas that continue to send pain signals back to the brain (Breward and Gentle, 1985). According to FAWC (1998), beak trimming is a most</p>	<p>The information was taken into account and issues discussed in chapter 4.3. (EFSA Journal 2010; 8 (7):1667)</p> <p>'Sometimes mutilations have become routine for traditional reasons and may no longer be required. The extent to which each</p>

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		<p>undesirable mutilation which should be avoided, if at all possible. Breeding companies must be urged to find a genetic solution to the problem of injurious pecking.</p> <p>De-spurring (removal of the spur bud, that is found further up the back of the leg, using a heated wire) is likely to cause pain. One of the main breeding companies has developed a strain that has short blunt spurs that do not damage the females. Routine de-spurring should not be necessary and other companies should be urged to develop similar strains (FAWC, 1998).</p> <p>Some parts of the industry remove the dew and pivot claw from the feet of males using sharp scissors. The last digits of the rear toes are also frequently removed and sometimes the last digit of the inner toes on each foot. There is evidence that these operations cause acute pain but with less longer-term pain than with beak trimming (Gentle and Hunter, 1988). It has been shown that toe clipping in turkeys increases mortality and reduces growth (Owings et al, 1972). This indicates that longer term welfare is affected by the procedure. Toe clipping may also interfere with scratching during foraging and cause problems with balance. As advised by FAWC in 1998, the industry should adopt management strategies that avoid the need for de-clawing such as reducing the ratio of males.</p> <p>A procedure called ‘dubbing’ is also carried out in most parts of the world. This is where part of the comb on the male chick’s head is removed using sharp scissors. The comb contains a rich nerve supply and it is almost certain that the procedure causes acute pain. However, dubbing may cause social problems later in life because combs are used in individual recognition (Guhl and Ortman, 1953). Dubbing was originally carried out to reduce the risk of damage to the comb caused by other birds and the environment. Most of these risks have now been eliminated and the procedure seems to continue out of habit. Breeding companies should be encouraged to educate their customers that the practice is not necessary (FAWC, 1998).</p> <p>Beward, J., Gentle, M. J., 1985. Neuroma formation and abnormal afferent nerve discharges after partial beak amputation (beak trimming) in poultry. <i>Experientia</i>, 41: 1132-1134.</p> <p>Duncan I. J. H., Forkman, B., 2006. Report on broiler breeder welfare in Denmark . Universtiy of Copenhagen Faculty of Life Sciences. 20p.</p> <p>Farm Animal Welfare Council (FAWC), 1998. Report on the welfare of broiler breeds. FAWC Surbiton, UK.</p> <p>Gentle, M. J., Hunter, L. N., 1988. Neural consequences of partial toe amputation in chickens. <i>Research in Veterinary Science</i>, 45: 374-376.</p>	<p>mutilation, and the methods used, is carried out in EU member states is not known. Because of its implications for welfare, data on the prevalence of beak trimming, de-toeing and de-spurring and the methods used should be collected as well as studies for their need.’</p> <p>See chapter 4.3. (EFSA Journal 2010; 8 (7):1667)</p>

ORGANISATION	CHAPTER_TEXT	COMMENTS_TEXT	COMMENTS_DEAL
		<p>Guhl, A.M. and Ortman, L.L., 1953. Visual patterns in the recognition of individuals among chickens. Condor 55: 287-298.</p> <p>Owings, W. J., Balloun, S. L., Marion, W. W. and Thomson, G. M., 1972. The effect of toe-clipping turkey poults on market grade, final w</p>	
Compassion in World Farming	1. Introduction	<p>The scientific evidence shows clearly that the way commercial broiler chickens and parent stock are bred inflicts serious health and welfare problems on the birds. Genetic selection for faster growth rate leads to painful leg disorders and heart failure in birds reared for meat and to severe food restriction and hunger in the breeding birds. Compassion in World Farming believes that urgent action is now essential to address the serious health and welfare problems of intensively farmed broiler chickens. This especially includes the need to use slower growing breeds which is shown to be a major factor in the reduction of incidence of leg disorders and heart diseases. The welfare of broiler breeders can be further improved by breeding birds whose health can be maintained without feed restriction and developing breeds and systems which avoid the need for mutilations. Major improvements in welfare could be achieved both for birds reared for the table and breeding birds by using strains with the genetic potential for a growth rate of no more on average than 45g liveweight gain per day, as required by Freedom Food standards in the UK (RSPCA, 2008).</p> <p>RSPCA, 2008. RSPCA Welfare Standards for Chicken.  <a href="http://www.rspca.org.uk/servlet/Satellite?blobcol=urlblob&amp;blobheader=application%2Fpdf&amp;blobkey=id&amp;blobtable=RSPCABlob&amp;blobwhere=1158755026986&amp;ssbinary=true">http://www.rspca.org.uk/servlet/Satellite?blobcol=urlblob&amp;blobheader=application%2Fpdf&amp;blobkey=id&amp;blobtable=RSPCABlob&amp;blobwhere=1158755026986&amp;ssbinary=true</a>          (accessed 12/08/09).</p>	<p>‘The major welfare concerns for broilers are leg problems, contact dermatitis, especially footpad dermatitis, ascites and sudden death syndrome. These concerns have been exacerbated by genetic selection for fast growth and more efficient food conversion. (see conclusions, EFSA Journal 2010; 8 (7):1666)</p> <p>‘Overall, there is a lack of quantitative data on variability of the husbandry and management systems used in Europe. This lack of data could not be fully compensated by the information given by the industry during the technical hearing. (see conclusions, EFSA Journal 2010; 8 (7):1667)</p> <p>The suggested reference is listed (EFSA Journal 2010; 8 (7):1666)</p>

ORGANISATION	CHAPTER_TEXT	COMMENTS_TEXT	COMMENTS_DEAL
Dutch Society for the Protection of Animals	6.8. Behavioural restriction	Lines 1592-1601: The relation between stocking density and welfare in relation to the ability to perform natural behaviour is missing in the report. Also the disturbance of broilers by walking over each other in relation to high stocking density is missing. Please add a reference on this item.	The issue was presented and discussed in chapter 3.8. 'Restriction of behavioural expression is partly due to a lack of space available for each bird. This lack of space depends on stocking density and is most likely to occur in the last week of life'. High stocking density was identified in the group of the major risk scores for likelihood of being exposed to a hazard that leads to poor welfare (welfare impact plus exposure to hazard) (chapter 3.8 and conclusions EFSA Journal 2010; 8 (7):1666)
Dutch Society for the Protection of Animals	6.6. Respiratory and mucous membrane problems	Add a reference to the use of antibiotics in broilers because of the occurrence of diseases and the difference of diseases and the use of antibiotics between fast growing and slower growing broilers.	There were included references on use of antibiotics and influence to the antimicrobial resistance and to the way of passive protection of progeny chicks against respiratory septicaemic disease (see chapter 3.11 and 3.6, EFSA Journal 2010; 8 (7):1666)
Dutch Society for the Protection of Animals	6.5. Ascites, pericarditis, sudden death syndrome and spiking mortality syndrome	Add the reference of van Middelkoop et al. (2002): the difference in ascites and other causes for mortality between slower growing breeds and fast growing breeds.	The information was taken into account and reference quoted and listed (see chapter 3.5, EFSA Journal 2010; 8 (7):1666)

ORGANISATION	CHAPTER_TEXT	COMMENTS_TEXT	COMMENTS_DEAL
Dutch Society for the Protection of Animals	6.2. Skeletal disorders	<p>In the chapter about skeletal disorders (par. 6.2.) and behavioural disorders (par. 6.8) I miss the reference to the PhD Thesis of Eddie Bokkers (Behavioural motivations and abilities in broilers - E.A.M. Bokkers; 2004, Wageningen University). In this thesis it was found that slower growing breeds are more active than fast growing, conventional breeds. The fast growing breeds want to be active, but can't, because they suffer from chronic pain and leg disorders.</p> <p>Par. 6.2, and more paragraphs: the text would be easier to read when the results from different researches would be put in tables. This would create a better overview over the different results.</p>	<p>The information was taken into account and reference quoted and listed (see chapter 3.8, EFSA Journal 2010; 8 (7):1666)</p> <p>The text was modified accordingly The main points are highlighted after the chapter (see chapter 3.2, EFSA Journal 2010; 8 (7):1666)</p>
Dutch Society for the Protection of Animals	5.1. Feed restriction	<p>lines 794-814: What is the difference in feed restriction between males and females? Please specify.</p> <p>Line 809: What is the effect of a skip-a-day feeding programme on the welfare of the broiler breeders in relation to frustration (they expect food at a fixed time, but do not get it).</p> <p>Line 835: What is the level of feed restriction for males in the production period compared to the females? Please specify.</p>	<p>'The degree and duration of feed restriction causes welfare problems associated with hunger. There is a lack of data on the effect of feed restriction in broiler breeder males as most research has been on females.</p> <p>Behavioural measurements and heterophil:lymphocyte ratios did not show more signs of stress in skip a day feeding compared with every-day feeding (Skinner-Noble and Teeter 2009a). However, research in this area is very limited</p> <p>There is less information available on feed restriction of males on the welfare of broiler breeders and it was decided to keep qualitative comparison '...Males are less severely restricted than</p>

ORGANISATION	CHAPTER_TEXT	COMMENTS_TEXT	COMMENTS_DEAL
			females during rearing (Renema et al., 2007) but during the production period the restriction level in males is more severe than in females' (see chapter 4.1, EFSA Journal 2010; 8 (7):1667)
Dutch Society for the Protection of Animals	4.3.2. Management during the rearing period	<p>Line 410: "The amount of feed supplied to broiler breeders during rearing is severely restricted." Add the word "severely" in the text.</p> <p>Line 418: what is the exact amount of feed restriction compared to ad lib intake? Indicate this in the text, specified for males and females.</p> <p>Line 422: What is "very small"? What is the amount of food supply compared to ad lib feed intake?</p> <p>Line 464: How much is the water access restricted and much is "a couple of hours"? Please specify.</p> <p>Line 461-467: Why do birds want to drink more? Because of chronic hunger? Please explain.</p>	<p>'..Feed is not as severely restricted as during the rearing period..'; (see chapter 3.4.2, EFSA Journal 2010; 8 (7):1667)</p> <p>Feed allocations during rearing are about one quarter to one third of the intake of unrestricted fed birds (Mench, 2002). (see chapter 3.3.2.4, EFSA Journal 2010; 8 (7):1667)</p> <p>The aim of part Water supply was to present existing practice and it was decided to keep information and quoted references as it was in the commented document. (see chapter 3.3.2.7, EFSA Journal 2010; 8 (7):1667)</p>
RSPCA	5.5. Ammonia and dust	Line 992: I believe that the term to be used here should be 'inhalable dust' rather than just 'dust', as it is the inhalable dust level that can cause the welfare issues as opposed to dust that has already settled.	The information was taken into account and change inserted. (see chapter 4.5, EFSA Journal 2010; 8 (7):1667)

ORGANISATION	CHAPTER_TEXT	COMMENTS_TEXT	COMMENTS_DEAL
RSPCA	5.4. Environmental enrichment	Section 5.4 Line 965: delete the word 'is'.	A correction was done. (see chapter 4.4, EFSA Journal 2010; 8 (7):1667)
EFFAB, AVEC, EPB, Copa-Cogeca, NFU	7.1. Production traits	Additionally to the previously submitted comments in this chapter:  1730. After " cages)." include: "The ability to house a very limited number of elite birds in cages for a short-period potentially offers future advantages in making progress on welfare related traits".	There is no enough information for including the proposed statement. Statement suggested, though well intentioned, is only speculative and it does not provide documented arguments to justify its inclusion (see chapter 5.1, EFSA Journal 2010; 8 (7):1666)
RSPCA	5.3. Mutilations	Line 884-891: there is no list of sort of the mutilations that are carried out at this point, which would be useful.  Line: 885: Is "tradition" the right term, or is it "as part of a routine managemnt practice"?  Linhe 886 - 888: the consequences of some mutilations on welfare, such as beak trimming, is clear and has been expanded on further on in the section. Therefore, this sentence should be amended .  Line 915: Could 'sham trimming' be explained.  Line 933: for each mutilation listed, could one line be added to each to explain why the procedure ios carried out.	The information was taken into account and corrections and clarifications inserted. (see chapter 4.3, EFSA Journal 2010; 8 (7):1666)

ORGANISATION	CHAPTER_TEXT	COMMENTS_TEXT	COMMENTS_DEAL
RSPCA	5.1. Feed restriction	<p>Line 786: Is use of the term "overweight" in this context correct? It indicates that the birds would become obese, which may be associated with fatness, but in fact the birds would be growing to their genetic potential for muscle growth - this is not fat. Therefore, could this be expressed differently? For example, could replace "overweight" with "a large size" or "a heavy weight" followed by "being achieved in a short period."</p> <p>Line 788: change "female" to "females".</p> <p>Lines 832 – 838: Is there any data available on the level of feed restriction in male broiler breeders.</p> <p>Line 834: The reference to males being less severely feed restricted than females is taken from the 1970's. Is this still the case, or are males now more severely feed restricted during this phase? This information could be determined from broiler breeder feed management guides published by the breeding companies.</p>	<p>The information was taken into account and corrections and inserted.</p> <p>‘It should be noted that research on the effects of feed restriction on the welfare of broiler breeders has focussed mainly on females. (see chapter 4.1, EFSA Journal 2010; 8 (7):1666).</p> <p>The information was taken into account and reference corrected (see chapter 4.1, EFSA Journal 2010; 8 (7):1666)</p>
EFFAB, AVEC, EPB, Copa-Cogeca, NFU	7.4. Trait combination - selection indices	<p>1843 – repetition of what has been observed before</p> <p>1857 – 1859 Add: – ‘and reliable and consistent data at the commercial level in all European countries are necessary to draw any conclusions on the welfare impact of genetic selection of broiler chickens.’</p> <p>1860 After ‘chickens’ include ‘These high prevalences are in contradiction with the provided Canadian and Danish public data where leg problems have decreased from 1999 to 2007 and 2005 respectively. Therefore, independent public comparable data, now not available in Europe, are important.’</p> <p>1861-1867 Cooper (EFSA, 2009 - public call for data) gave a description of the selection points related to health and welfare. He stated that the following parameters are considered for the selection of broilers: quality and liveability of chicks produced, varus-valgus deformities, rotated legs, loose joints, crooked toes, back defects, and cardiovascular health. Considering all the traits mentioned, a delicate balance is required to meet consumer and industry demand. No validated data were available to assess precisely the weight of such criteria in selection and the impact on broiler welfare. This is by no means a comprehensive list of the “parameters” discussed. As with many publications or interviews in the past this could be, and likely will be taken out of context of the discussion as the ONLY parameters used to evaluate health and welfare</p>	<p>Repetition was removed.</p> <p>The highlighted points were modified to ‘The level of genetic improvement of individual traits cannot be quantified due to the lack of access to pertinent data. There should be standardised objective monitoring of welfare in commercial flocks in a system harmonised across different countries, to assess phenotypic trends of various traits as well as the impact of genetic selection on these traits’. See highlights at the end of the chapter 5(EFSA Journal 2010; 8 (7):1666)</p>



ORGANISATION	CHAPTER_TEXT	COMMENTS_TEXT	COMMENTS_DEAL
		<p>traits by our company or others if the statement is left as it is. To be accurate this statement needs to read “He stated that a few of the parameters considered for the selection of broilers include quality and livability of chicks produced, varus-valgus deformities, rotated legs, loose joints, crooked toes, back defects, and cardio-vascular health.</p> <p>1876 Replace ‘Meuwissen and Goddard (2001)’ by ‘Meuwissen et al (2001)’</p>	<p>The statement and citation of the author were corrected (see chapter 5.4, EFSA Journal 2010; 8 (7):1666)</p>
<p>EFFAB, AVEC, EPB, Copa-Cogeca, NFU</p>	<p>6.5. Ascites, pericarditis, sudden death syndrome and spiking mortality syndrome</p>	<p>1450-1451: is a repetition of the sentence in 1447-1448            1456 Delete ‘y’ in ‘Druyan et al’            1458 – ‘show’ is ‘shows’            1459 This is not the naked neck gene that brings lower % Ascites , this is the slower growth . Pen trials environment is not the most appropriate situation to draw conclusions regarding these metabolic disorders. Bigger flock size and bigger flocks numbers give more reliable data.            1465– 1472 Primary breeding stock were used to establish an ascites resistant, susceptible and a control line at the University of Arkansas in 1995. Close cooperation between the researchers and the primary breeders over time have resulted in greater understanding of ascites and tools for breeding within primary breeding operations. Below are some references to these populations:</p> <p>Anthony, N.B., Balog, J.M., Hughes, J. D., Stamps, L., Cooper, M.A., Kidd, B. D., Liu, X., Huff, W.E., Huff, G.R., and Rath N. C., 2001. Genetic selection of broiler lines that differ in their ascites susceptibility 1. Selection under hypobaric conditions. Proc. 13th European Symposium on Poultry Nutrition, Blankenberge, Belgium. Pages 327-328. (Proceedings)</p> <p>Balog, J.M., Anthony, N.B., Kidd, B.D., Liu, X., Cooper, M.A., Huff, G.R., Huff, W.E., Wideman, R.F. and Rath N. C., 2001. Genetic selection of broiler lines that differ in their ascites susceptibility 2. Response of the ascites lines to cold stress and bronchus occlusion. Proc. 13th European Symposium on Poultry Nutrition, Blankenberge, Belgium. Pages 329-330. (Proceedings)</p> <p>Cisar, C.R., Balog, J.M., Anthony, N.B., and Donoghue, A. M., 2001. Genetic selection of broiler lines that differ in their ascites susceptibility 1. Progress on identification of differentially expressed genes in ascitic and non-ascitic birds. Proc. 13th European Symposium on Poultry Nutrition, Blankenberge, Belgium. Pages 331-332. (Proceedings)</p>	<p>The information was taken into account, correction done and reference list updated with relevant to the developed text articles (see chapter 3.5 and references, EFSA Journal 2010; 8 (7):1666)</p>

ORGANISATION	CHAPTER_TEXT	COMMENTS_TEXT	COMMENTS_DEAL
		<p>Balog, J.M., B.D. Kidd, N.B. Anthony, G.R. Huff, W.E. Huff, N.C. Rath, 2003. Effect of cold stress on broilers selected for resistance or susceptibility to ascites syndrome. . Poul. Sci. 81:1383-1387.</p> <p>Pavlidis, H.O., L.K. Stamps, J.D. Hughes, J.M. Balog, and N.B. Anthony, 2007 Divergent selection for ascites incidence in chickens. Poul. Sci. 86:2517-2529.</p> <p>1472 Delete 'y' in 'Druyan et al'            1473 Delete 'y' in 'Druyan et al'            1474 Delete 'y' in 'Druyan et al'            1475 Delete 'y' in 'Druyan et al' (2x)</p>	<p>The name of the author according to ISI web of knowledge is Druyan S (see references, EFSA Journal 2010; 8 (7):1666)</p>
<p>EFFAB, AVEC, EPB, Copa-Cogeca, NFU</p>	<p>7.1. Production traits</p>	<p>1715 After 'programme A' include 'An important side-effect of selection for efficiency is the decrease of environmental output of poultry production.'</p> <p>1732 This is not true, it depends on what market you are addressing. Example: Japan prefers leg red meat.</p> <p>1738 Change 'will' into 'may'</p> <p>1744-1746 Hereditary differences for production traits among individual birds have been found to account for between 0.25 and a 0.5 of performance differences; this proportion has been scientifically termed "heritability" of a trait. Assuming the trait is modeled correctly, ¼ on the low end is too high. The range should be something more like 0.1 to 0.6, not 0.25 to 0.50.</p>	<p>The information was taken into account and correction done (see chapter 5 and 5.1, EFSA Journal 2010; 8 (7):1666)</p>

ORGANISATION	CHAPTER_TEXT	COMMENTS_TEXT	COMMENTS_DEAL
EFFAB, AVEC, EPB, Copa-Cogeca, NFU	6.2. Skeletal disorders	<p>1272 After ‘lameness’ include ‘Skeletal disorders as measured via publicly available data shows the following trends: arthritis 1999-2007 from 1 to 0.18 %, ascitis from 35 to 10%, synovitis from 1.6 to 0.5%, varus-valgus disease from 5 to 0.2 % (Canadian data), and foot pad dermatitis 1999 to 2005 from 57 to 0.7 % (Danish data). The following intervention describes a range of studies on skeletal problems.’</p> <p>1277 Replace ‘may result’ in ‘might have resulted’</p> <p>1278 After ‘2000’ add ‘in the past’, and add "Due to balanced breeding programmes and improved housing and management, bone quality has improved since at least 1999, which is shown from the public Canadian and Danish data,’</p> <p>1282 Before ‘Leg’ add ‘In the past’, and replace ‘are’ by ‘were’</p> <p>1285 Replace ‘have’ by ‘had’</p> <p>1286 ‘Middlekoop’ is ‘Middelkoop’</p> <p>1292 These are old data, meanwhile in practice there is much improvement.</p> <p>1296 After ‘disorders’ include ‘This is in contradiction with the practical public data that show increase in growth rate (from 1999- 2007 1.6 to 1.8 kg at same age, Canadian data) while at the same time skeletal disorders decreased.’</p> <p>1327 Delete ‘score’</p>	<p>The heading of the chapter was changed to Musculoskeletal disorders. The text was modified technical corrections and quotations were done. (see chapter 5 and 5.1, EFSA Journal 2010; 8 (7):1666)</p>
EFFAB, AVEC, EPB, Copa-Cogeca, NFU	References	<p>2175 – 2517 Missing literature references (second part)</p> <p>1286 Middelkoop et al (2002)</p> <p>1298 Le Bihan-Duval et al (1997)</p> <p>1308 Kuhlert and McDaniel (1996)</p> <p>1343 Pfeiffer et al (personal communication)</p> <p>1363 Sandercock et al (2006)</p> <p>1371 Hollands et al (1986)</p> <p>1373 Grunder et al (1984)</p> <p>1393 Algers and Berg (2001)</p> <p>1394 Algers and Berg (2004)</p> <p>1397 Middelkoop et al (2002) and Cooper</p> <p>1412 Melluzi et al (2008)</p> <p>1424 Gouveia et al (2009)</p> <p>1434 Riddell (1991)</p> <p>1438 Brown (1991)</p> <p>1440 Burns et al (2002), Davis and Vasilatos-Younken (1995)</p> <p>1442 Davis et al (1996)</p> <p>1453 Hernandez et al (2002) (also line 1462), de Smit et al (2005)</p>	<p>References checked, corrected and those that were missing added to the list in the opinions when considered as relevant (see References, EFSA Journal 2010; 8 (7):1666) and (References, EFSA Journal 2010; 8 (7):1667)</p>

ORGANISATION	CHAPTER_TEXT	COMMENTS_TEXT	COMMENTS_DEAL
		<p>1454 Baghbanzadeh and Decuyper (2008) (also line 1478), Ghazani et al (2008)            1456 De Greef et al (2001),            1458 Gonzales et al (1998)            1473 Balog et al (2003)            1483 Pakdel et al (2005) (also lines 1486, 1488)            1490 Greff et al (2001)            1495 Deeb et al (2002)            1505 Hassanzadeh et al (2004) (also line 1507)            1507 De Sit et al (2008)            1509 Grashorn (1994)            1511 Moghadam et al (2005)            1527 Gomis et al (2001)            1529 Gross (1994), Barnes and Gross (1997)            1531 Wray et al (1996)            1532 Dho-Moulin and Fairbrother (1999)            1537 Kariyawasam et al (2004)            1545 Ahmed and Sarwar (2006) (also line 1574)            1552 Reiter and Bessei (2000)            1555 McLean et al (2002)            1583 Al-Murrani et al (1997) (also line 1590)            1605 Weeks et al (1994)            1609 Nielsen et al (2003)            1611 Lichovnikova et al (2009)            1614 Bizeray et al (2000) (also line 1617)            1619 Defra research report OF0153 (2002)            1649 Balloy (2003) (also line 1654)            1650 Hermans et al (2006)            1652 Van der Sluis (2005)            1656 Pedersen (2003)            1656 Ask et al (2006)            1703 Hocking, D'Eath and Kjaer (in press)            1810 Heck et al (2004)            1849 Defra            1851 Kestin et al (1992)            1861 Cooper (2009)            1954 Bentley (2006)</p>	

ORGANISATION	CHAPTER_TEXT	COMMENTS_TEXT	COMMENTS_DEAL
<p>EFFAB, AVEC, EPB, Copa-Cogeca, NFU</p>	<p>References</p>	<p>2175 – 2517 Missing literature references            128 Hocking, D'Eath and Kjaer (in press)            130 No reference of Figure 3 is given            132 No reference of Figure 4 is given            136 No reference of Figure 5 is given            516 Lewis, P., Morris.T. (2006). Poultry Lighting – The Theory and Practice. Northcot, UK. ISBN 0-9552104-0-2 978-0-9552104-0-2.            Lewis, P.D. (2009). Photoperiod and Control of Breeding pp 243-260 in Biology of Breeding Poultry Ed P.M.Hocking. CABI.            726 Duncan and Forkman (2006)788 Heck et al (2004) should be Hein et al            812 Skinner-Noble, D.O., Teeter, R.G. (2009a) Feed restriction for broiler breeder pullets, Comparison of Well Being Consequences of Three Feed Restriction Programs for Broiler Breeder Pullets. Department of Animal Science. Oklahoma State University. Stillwater. Thesis. 27 pp and excel file with tables. In preparation. Please respect the writer's willingness to share the thesis and original tables with you, and do not copy or use them in any form for other purposes than this evaluation.            Skinner-Noble, D.O., Teeter, R.G. (2009b). Environment, Well-being, and behavior, An examination of anatomic, physiologic, and metabolic factors associated with well-being of broilers differing in field gait score. 2009 Poultry Science 88:2–9            DOI:10.3382/ps.2006-00450. (Final stages of submission process to Poultry Science)            Please respect the writer's willingness to share this with you, and do not copy or use them in any form for other purposes than this evaluation            874 Cooper, M.A. (2004). Selection Environment – Which should we choose? Adapted from: The interaction of feed restriction and selection for growth in Coturnix coturnix japonica. 137pp. (Dissertation) **In the process of updating for submission to World's Poultry Science Journal**            Cooper, M.A. (2009a). Broiler &amp; Breeder Traits Selected Upon Within a Primary Breeder and Their Influence on Welfare/Well-Being, Personal Communication.            Cooper, M.A. (2009b). Free range disease. Personal Communication.            Cooper, M.A. (2009c). Gait Scoring Considerations. Personal Communication.            1080 Canadian public data <a href="http://www.agr.gc.ca/poultry/condmn_eng.htm#chicken">http://www.agr.gc.ca/poultry/condmn_eng.htm#chicken</a>            1106 Geflügeljahrbuch 2010            1180 Hartung (1999)            1215 Scott and Mackenzie (1993), Roque and Soares (1994), Reis et al (1997), Bruzual et al (2000), Elibol et al (2002), Elibol et al (2008)            1219 Pedroso et al (2005), Elibol et Brake (2006), Almeida et al (2008)</p>	<p>References checked, corrected and those that were missing added to the list in the opinions when considered as relevant (see References, EFSA Journal 2010; 8 (7):1666) and (References EFSA Journal 2010; 8 (7):1667)</p>

ORGANISATION	CHAPTER_TEXT	COMMENTS_TEXT	COMMENTS_DEAL
		<p>1221 Stamp and Andrews (1995)            1221 Raju et al (1997)            1248 Casey et al (1989)            1252 Middelkoop et al (2002)            1255 Cooper            1262 Kirkwood JK (2006) in Turner &amp; D"Silva (2006) Animals, ethics and trade:12-26. Earthscan, London.            Neeteson-van Nieuwenhoven, A.-M., Hardiman, J. (2010) Balanced Sustainable Welfare Friendly Animal Breeding. In: Proceedings of 'Global Food Security: Ethical and Legal Challenges. EurSafe Congress 2010 Bilbao. In press.            1264 Hernandez et al (2002)            1266 Carnacho-Fernandez et al (2002)</p>	
<p>EFFAB, AVEC,            EPB, Copa-Cogeca,            NFU</p>	<p>9.1. Indicators used in practice</p>	<p>2124 -2126 'although the pain associated with de-toeing has not been evaluated, it would be useful to know the number of birds subjected to this procedure.' Why would it be useful? Why not first doing research on pain related to de-toeing?</p>	<p>The text of the chapter was modified. Several of these indicators, and the scientific studies underlying them, have also been referred to earlier in this report in various sections. (See chapter 4.EFSA Journal 2010; 8 (7):1666)</p>
<p>EFFAB, AVEC,            EPB, Copa-Cogeca,            NFU</p>	<p>8.3. Importance of the genetic diversity</p>	<p>2022 The loss of genetic diversity has been taking place mainly between jungle fowl and 19th century birds, thereafter it was less. It should be noted in this portion that the breeding companies started out with foundation stocks such as the White Rocks or Cornish lines and have used them or combined them in various manners to form the lines that they have today. These foundation stocks are still in existence around the world and are not under our control. The genetic variation in these outside foundation populations is not under our control and would have likely change due to genetic drift over time.            2032 – 'high quality markets': this is a qualification without any common definition of 'high quality markets'. This would give the impression that others produce low quality meat, which is not true. Specialty markets would be a better word.</p>	<p>The report states clearly, that loss of diversity occurred before the development of intensive breeding industry.             (See chapter 6.2. EFSA Journal 2010; 8 (7):1666)            '...specialty or „niche“ markets in which mature carcass and meat quality is important (See chapter 6.3. EFSA Journal 2010; 8 (7):1666)</p>

ORGANISATION	CHAPTER_TEXT	COMMENTS_TEXT	COMMENTS_DEAL
EFFAB, AVEC, EPB, Copa-Cogeca, NFU	8.2. How do the breeding companies deal with G × E interaction	2009 If this reference is Cooper, 2004, then is is spelled wrong. This is on the long list of references not in the Reference list and several are simply listed as Cooper, which adds to the confusion. Some are quotes of Marc Cooper of RSPCA, and some are of Mark Cooper of Cobb-Vantress, Inc..	Correction was done. Citation to the author in relation to Selection points to health and welfare was included in chapter 5.4 (EFSA Journal 2010; 8 (7):1666)
EFFAB, AVEC, EPB, Copa-Cogeca, NFU	8.1. Welfare aspect of G × E interaction	<p>1995 – ‘that where ‘; 1997-1998 – ‘It may be generally thought that novel environments to which the selected genotype has not been exposed will cause harm the welfare of the chickens but the evidence is sparse.’ The statement should be deleted, as there is no scientific neither practical background, or rephrased as ‘There is sparse evidence that novel environments to which the selected genotype has not been exposed will cause harm for the welfare of the chickens’</p> <p>1997 After ‘birds’ include ‘However, this is making correlations, which do not do justice to the reality. ‘Human demand leads to changes in breeding goals. (Neeteson and Hardiman, 2010).’ Different types of demands will lead to different animals with different characteristics, one of them being differences in types of leg conditions. There is no evidence that faster growing lines would have increased leg problems as the type of leg issues varies over lines. ’</p> <p>1999 – ‘where in which’ should be ‘in which’ or ‘where’</p> <p>2000 – ‘that the selection one’ should be ‘than the selection one’</p> <p>2002 This statement is absolutely wrong. Breeding companies are selecting against leg disorders, and with good result.</p>	<p>As few G x E investigations have specifically included welfare examinations, there is sparse evidence that novel environments to which the selected genotype have not been exposed to, will harm the welfare of the chickens.</p> <p>Technical corrections were done (See chapter 6, 6.1, 6.2, 6.3, EFSA Journal 2010; 8 (7):1666).</p>
EFFAB, AVEC, EPB, Copa-Cogeca, NFU	7.6. Policies of breeding companies regarding selection for welfare versus production	<p>1921 "...have been selecting for welfare traits before 1980 (Mercer..." We believe that various aspects of skeletal integrity are very much welfare related traits, and as such date back well before 1980.</p> <p>1948+1955 The annual change in body weight in practice is in the order of 40-80 g at slaughtering, not per day.</p> <p>1955 Table 2 is one generation of selection. Units must be GRAMS, it can not be g/day</p>	The information was taken into account and corrections were incorporated in the text (See chapter 5.6, EFSA Journal 2010; 8 (7):1666).

ORGANISATION	CHAPTER_TEXT	COMMENTS_TEXT	COMMENTS_DEAL
EFFAB, AVEC, EPB, Copa-Cogeca, NFU	7.3. Reproduction traits	<p>1790 Replace 'Breeding programmes' may' by 'There has been a perception that breeding programmes would'</p> <p>1792 After 'traits' include 'This is not the case in modern broiler breeding programmes, where both in male and female lines reproduction is important.'</p> <p>1803 – 'Genetic correlations between reproduction and production traits are antagonistic' - Breeding companies now manage to deal with the antagonistic effects</p> <p>1810 Comparing 'restricting' and 'ad libitum' is not illustrating the antagonistic relationship between growth and reproductive traits</p> <p>1818 – 'food' should be 'feed'</p> <p>1818 After 'gain' include 'In general it can be said that decreases in reproductivity directly severely influence the effectiveness and profitability of breeding programmes – therefore optimal reproduction is a matter of constant care.'</p>	<p>The information was taken into account and corrections were incorporated in the text (See chapter 5.3, EFSA Journal 2010; 8 (7):1666).</p> <p>The comparison is presented as it provides justification for restricted feeding, not for antagonistic association between growth and fertility. (See chapter 5.3, EFSA Journal 2010; 8 (7):1666).</p>
EFFAB, AVEC, EPB, Copa-Cogeca, NFU	7.2. Health, fitness and welfare traits	<p>1761-1764 "It should be noted that this category consists mainly of health- and fitness-related traits and that whereas good health and fitness is a prerequisite to welfare, the latter is not explicitly addressed in current genetic selection programmes. " False. This statement indicates a lack of knowledge of what occurs in our current programmes, is sorely undefined and totally unacceptable.</p> <p>1774 – 'usually compromises' or 'may compromise' see also line 1996 Breeding companies now manage to deal with the antagonistic effects.</p> <p>1782 Myeloid leucosis – there is no need to select for this resistance, because this issue was addressed by eradication of the virus in the pedigree flocks.</p>	<p>The information was taken into account and corrections were incorporated in the text (See chapter 5.2, EFSA Journal 2010; 8 (7):1666).</p>



ORGANISATION	CHAPTER_TEXT	COMMENTS_TEXT	COMMENTS_DEAL
<p>EFFAB, AVEC, EPB, Copa-Cogeca, NFU</p>	<p>7. Genetic selection of broilers</p>	<p>1694 Figure 2 needs to be adapted. We do not understand the background of the table in this context 50 million is about what the pedigree contributes, 70 million is about what the grandparents contribute. See also line 244            1704 Replace ‘may be’ by ‘is being’</p> <p>1711-1713 After ‘EFFAB’ include ‘and EPB’            ‘The table mixes traits and trait categories. We propose to change ‘health and welfare traits’ by ‘health and welfare categories’, ‘reproduction traits’ by ‘reproduction traits and categories’. Or, alternatively, all traits are being written out.’            In case you choose for ‘categories’ and not write out the current traits, a note should be made: ‘most categories include many traits.’ ‘            1714 If the individual health, fitness and welfare traits are not being written out in Table 1, they should be written out here, as the current examples give just a tiny indication of the amount of these traits in the breeding programme. Include: ‘The health, fitness and welfare related traits, that currently are being included in the major breeding programmes are: 1) skeletal integrity (leg condition: varus, valgus, cow boy etc.,; toes: crooked toes; keel straightness; breast blisters; food pad lesions; hock burns; family % of culls due to leg problem in ‘broiler’ period; Tibial Dyschondroplasia; hip condition; joint integrity) 2) heart / lung fitness: (family % of mortality due to Ascitis and SDS in ‘broiler’ period; Blood O2 saturation measured with oximeter; phenotypic/physical evaluation of candidates; ECG/EKG) 3) robustness miscellaneous (selection in different environments including e.g. different feed specifications; feather cover during broiler period, especially slow feathering lines; absence of AGPs, coccidiostats etc) 4) behaviour (pecking behaviour in production; female condition at end cycle) 5) Miscellaneous (egg size/weight; liveability in production; culling of poor quality chicks; male aggressiveness in floor pedigree pens).’            This list is comprehensive, but not limited.</p>	<p>The information was taken into account. The text was modified (See chapter 5, EFSA Journal 2010; 8 (7):1666).</p>

ORGANISATION	CHAPTER_TEXT	COMMENTS_TEXT	COMMENTS_DEAL
EFFAB, AVEC, EPB, Copa-Cogeca, NFU	6.11. Digestive problems	<p>1646 Before ‘During’ include ‘This chapter will give a description on available literature on digestive problems, to picture into detail what has been going wrong in the past and could still go wrong at places. It will conclude with a link to the scarce amount of available public data.’</p> <p>1652-1654 "According to Van Der Sluis, (2005) 94 % of the world producers would have declared a form of bacterial enteritis that is necrotic or non-specific in origin. " Strike this statement as it is false. This is not accurate if you look at the “world” producers as a whole.</p> <p>1655-1656: Clostr. Perfringens is the main causal agent for disease in slow growing organic broilers !! So it is wrong to say that it is spread by fast growing broilers. It has nothing to do with growth rate by itself. This is again a statement that is scientifically wrong .</p> <p>1663-1673 Where is the link of this paragraph with welfare?</p>	<p>The comment was considered but it was decided to keep the beginning of the chapter as it was in the original text. Corrections were inserted in the text (See chapter 3.11, EFSA Journal 2010; 8 (7):1666).</p>
EFFAB, AVEC, EPB, Copa-Cogeca, NFU	6.10. Nutrition and feed management, water	<p>1642 Just only mentioning negative aspect of nipples and not mentioning negative aspects of bell drinkers suggests that bell drinkers are to be preferred. Bell drinkers give a higher probability of having a high bacterial load compared to nipple waterers. It is a matter of good management, with all types of drinkers.</p> <p>1644 After ‘drinkers’ include ‘The instructions in poultry management guides are meant to give detailed directions and solutions to questions on nutrition, feed management and water that might occur.’</p>	<p>Nipple drinkers have advantages over bell drinkers in that they improve water hygiene (e.g. by reducing bacterial load),</p> <p>It is important that good management systems are in place for water so that wet litter does not occur. (See chapter 3.10, EFSA Journal 2010; 8 (7):1666).</p>
EFFAB, AVEC, EPB, Copa-Cogeca, NFU	6.9. Environmental factors linked to welfare problems	<p>1625+1626 – ‘problems’ can be deleted or replaced by ‘aspects’</p> <p>636 After ‘automatic’) include. "Poultry breeding and production put a lot of emphasis on good housing and management – for that reason the management guides are important – it is also important they are being updated continuously according to the latest findings. The strength of the management guides is that they give detailed instructions, but are put together in internationally cooperating teams who, next to</p>	<p>It was decided by WG to keep term ‘welfare problems’</p> <p>Many of these management factors are covered in the</p>

ORGANISATION	CHAPTER_TEXT	COMMENTS_TEXT	COMMENTS_DEAL
		detailed technical information, also guard at the overall aspects, and total balanced outcome of the individual instructions.’	manuals produced by the industry. (See chapter 3.9, EFSA Journal 2010; 8 (7):1666).
EFFAB, AVEC, EPB, Copa-Cogeca, NFU	6.8. Behavioural restriction	<p>1592 " Restriction of behavioural expression is mainly due to lack of space available for each bird. " Where does this come from, where are the references? Broilers and broiler breeders have sufficient space to perform natural behaviours.</p> <p>1608-1609 "... the fast growth rate had a low usage of the outdoor area, i.e. an impaired mobility (Nielsen et al., 2003). " Strike "i.e. an impaired mobility". It cannot be assumed that less use of the outdoor areas by lines selected for so many generations for performance indoors is equivalent to impairment of mobility. If this behaviour is different it does not mean that the welfare is impaired.</p> <p>1609-1611 "Comparisons between a commercial laying hybrid (Isabrown, IB) and a fast growth rate broiler (Ross 308, R) showed that IB spent more time moving and less time resting than R in the second part of the rearing period (Lichovnikova et al., 2009." It is scientifically wrong to draw conclusions from comparison of lines which have been selected for such drastically different purposes. If this behaviour is different it does not mean that the welfare is impaired.</p> <p>1624 After ‘pecking’ include ‘ “The domestication of animals in itself implies a dynamic process of the adaptation of species to the environment, and vice versa. Over time, the farmed animal and the pet animal have been differentiating from their wild ancestors: the pig from the wild boar, the dachshund from the wolf, and evolved, in the case of pig, from sus scrofa scrofa to sus scrofa domesticus. Human demand leads to changes in breeding goals. The demand for lean meat, for instance, has led to a change in breeding goals in pigs (changing the ‘lard-type’ into the ‘meat-type’ pig) due to a change of human lifestyle. Thus, in consuming meat, milk or eggs, we take the responsibility for farming animals. We can do that as good as we can, balancing the various sustainability items described above. The choice for balanced sustainable breeding will lead to different outcomes, depending on e.g. customer requirement, or region.”(Neeteson and Hardiman, 2010).’ This goes also for poultry breeding where different types of demands will lead to different animals with different characteristics, one of them being the desire to peck more or just the desire to eat and rest more. These differences are the consequence of the diversity in poultry lines.’</p>	<p>Restriction of behavioural expression is partly due to a lack of space available for each bird. This lack of space depends on stocking density and is most likely to occur in the last week of life.</p> <p>A comparison between an experimental low growth rate broiler (experimental cross) and a fast growth rate broiler (Ross) reared with access to an outdoor area showed that the fast growth rate had a low usage of the outdoor area due to impaired mobility (Nielsen et al., 2003).</p> <p>It was decided to keep results of the work of Lichovnikova et al., 2009. Time spent feeding did not differ between breeds but time spent ground pecking was different with the active very slow growing breeds spending a large proportion of time ground pecking (See chapter 3.8, EFSA Journal 2010; 8 (7):1666).</p>

ORGANISATION	CHAPTER_TEXT	COMMENTS_TEXT	COMMENTS_DEAL
EFFAB, AVEC, EPB, Copa-Cogeca, NFU	6.7. Thermal discomfort	1544 – ‘be only be’ replaced by ‘be only’	Correction was done (See chapter 3.7, EFSA Journal 2010; 8 (7):1666).
EFFAB, AVEC, EPB, Copa-Cogeca, NFU	6.4. Contact dermatitis	1397 - ‘Middlekoop’ is ‘Middelkoop’	Correction was done (See chapter 3.4, EFSA Journal 2010; 8 (7):1666).
EFFAB, AVEC, EPB, Copa-Cogeca, NFU	6.2. Skeletal disorders	<p>1272 After ‘lameness’ include ‘Skeletal disorders as measured via publicly available data shows the following trends: arthritis 1999-2007 from 1 to 0.18 %, ascitis from 35 to 10%, synovitis from 1.6 to 0.5%, varus-valgus disease from 5 to 0.2 % (Canadian data), and foot pad dermatitis 1999 to 2005 from 57 to 0.7 % (Danish data). The following intervention describes a range of studies on skeletal problems.’</p> <p>1277 Replace ‘may result’ in ‘might have resulted’</p> <p>1278 After ‘2000’ add ‘in the past’, due to balanced breeding programmes and improved housing and management, bone quality has improved since at least 1999, which is shown from the public Canadian and Danish data,’</p> <p>1282 Before ‘Leg’ add ‘In the past’, and replace ‘are’ by ‘were’</p> <p>1285 Replace ‘have’ by ‘had’</p> <p>1286 ‘Middlekoop’ is ‘Middelkoop’</p> <p>1292 These are old data, meanwhile in practice there is much improvement.</p> <p>1296 After ‘disorders’ include ‘This is in contradiction with the practical public data that show increase in growth rate (from 1999- 2007 1.6 to 1.8 kg at same age, Canadian data) while at the same time skeletal disorders decreased.’</p> <p>1327 Delete ‘score’</p>	Text was modified and technical corrections done. There are serious welfare concerns over skeletal disorders in chickens. Some skeletal disorders are already being addressed in selection (e.g. TD). (See chapter 3.2 and highlights at the end of the chapter, EFSA Journal 2010; 8 (7):1666).
EFFAB, AVEC, EPB, Copa-Cogeca, NFU	6.1. Mortality	<p>1262 We know from experience that when we deal with mortality, pen trials are not the appropriate way to make estimates on mortality. To make judgements about mortality trends, you should look at field data with large numbers, instead of small pen trial numbers in field conditions that are hardly relation to the practical situation</p> <p>Although the economic reality is not within the remit of the working group, it is important to add the following (like in the other cases of e.g. AI and cages for diverse market demands , and for a diverse port folio for Europe ): ‘On an economic viewpoint the slow growing breeds cannot cover the whole range of broiler markets segments , they can represent up to a certain percentage of the market, and do so. “the ethics of democratic welfare improvements (welfare improvements for all the animals) need to be weighed against (maybe per animal larger) welfare improvements for happy few animals. Improving animal welfare of all production animals will not enlarge market</p>	<p>The link between mortality and genetic selection was assessed mostly through experimental reports since no field data are published in a validated way, but we can assume that the global tendency is the same in the field. (See chapter 3.1, EFSA Journal 2010; 8 (7):1666).</p> <p>Economical and ethical</p>

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		<p>shares and margins of stakeholders in the food chain – whilst the per animal larger welfare improvements of a few animals is a commercially attractive ‘increased welfare label’ concept.</p> <p>Also, an important aim is to avoid the export of animal welfare issues to less stringently regulated areas, so that unsustainable products will be exported back unnoticed. “ (Neeteson and Hardiman, 2010)</p> <p>When Europe would choose for slow growing birds only, or too stringent production measures, poultry production in Europe would decrease on the cost of imports. Then the overall welfare of poultry will not be improved. It is important to weigh these aspects in all cases: standard and slow growing birds vs losing production Europe, AI and cages for some special lines vs diversity. And in general, the diversity in Europe of democratic poultry production and specialized products.’</p> <p>1269 After ‘animals.’ Add ‘The only public dataset available (Canadian) shows a decrease of ascitis of 35 to 10 from 1999-2007.’</p>	<p>aspects are out of the remit of the mandate.</p> <p>Economical and ethical aspects are out of the remit of the mandate.</p>
<p>EFFAB, AVEC, EPB, Copa-Cogeca, NFU</p>	<p>6.1. Mortality</p>	<p>1239 ‘Mortality figures evolved with rationalization of broiler production with genetic and feed composition’ could be interpreted that mortality has increased over time, which is not the case. Please replace it with ‘Mortality stayed the same with the professionalisation of broiler production with finetuned genetic selection, feed composition, housing and management. For instance, French and Canadian public data (Morbihan, 1982-2008, Canada 1999-2007) indicate fluctuations in time of levels that stay more or less the same. Agristats data show an increase of liveability from 1988 to 2008. In the Netherlands the culling of randomly chosen 30 broiler farms steadily decreased from 5 in 1998 to 3.9 % in 2008.’</p> <p>1241 After ‘6.6)’ include ‘In the only extensive public dataset available (Canadian data), disease and most digestive disorders related causes of death decreased from 1999 to 2007: enteritis 0.05 to 0%, jaundice 0.1 to 0.04%, Marek’s cutaneous form 9 to 0.2 %, Marek’s visceral form 0.32 to 0.02%, neoplasm (squamous cell) 0.52 to 0.05%, neoplasm (nos) 0.1 to 0.04%, nephritis 0.05 to 0.01%, pendulous crop 1.1 to .05 %, peritonitis 1.7 to 1.1 %, salpingitis 0.9 to 0.55 %, synovitis 1.6 to 0.5%.’</p> <p>‘In the past (literature 1989-2003) various studies have been undertaken in which breeds were compared, with various outcomes. Some examples.’</p> <p>L1244-1248: The breeds should be Ross 308 and Cobb 500. We absolutely do not want to discredit the idea that the breeds were different in their response to high or low levels of protein. Both breeds have limitations on both ends of the nutrition spectrum. However, if you read the journal article you will see that there was no difference in mortality in Experiment 1. In Experiment 2 there was a difference, but only at the</p>	<p>There is some experimental evidence that higher growth rates of certain genotypes are associated with increased mortality. Mortality rates in slow growing strains may be lower than in standard lines but also depends of other factors e.g. type of production, feeding regime, rearing duration and management. (see chapter 3.1 and highlights at the end of the chapter, EFSA Journal 2010; 8 (7):1666).</p> <p>Berhe and Gous (2008) studied the effect of dietary protein content on growth, uniformity and mortality of two commercial broiler</p>

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		<p>highest protein levels. The protein levels that resulted in significant differences are far in excess of Cobb's recommendations. So, a blanket statement about 2X the mortality for one strain is not justifiable. It should also be noted that even on the highest protein levels, where this difference occurred, Cobb had 1.20% &amp; 1.15% mortality at over 2.5Kg in 42 days. With this level of performance you would be able to stock at the highest densities allowable under the new EU guidelines for stocking density and mortality.</p> <p>1252 – 'Middlekoop' is 'Middelkoop'</p> <p>1262 – Is mortality by nature a welfare problem?</p>	<p>strains (Ross 308 and Cobb 500) in two experiments (1) in cages until 21d and 2) on the floor until 42d). Mortality did not appear to be related to the nutritional treatments imposed on the Ross strain in either of the experiments, although the difference between strains was statistically significant (P &lt;0.01) only in Experiment 2. In both experiments the Cobb birds showed a tendency to a higher mortality at the lowest dietary protein contents, and in the second experiment mortality increased exponentially on the highest feed protein contents.</p> <p>(see chapter 3.1, EFSA Journal 2010; 8 (7):1666). The name was corrected to Middelkoop.</p> <p>Mortality itself does not directly reflect animal welfare but can impact welfare if we consider the way and the reason for animals dying. (see chapter 3.1 and highlights at the end of the chapter, EFSA Journal 2010; 8 (7):1666</p>

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<p>EFFAB, AVEC, EPB, Copa-Cogeca, NFU</p>	<p>6. Overview of the welfare of broilers</p>	<p>1188-1189: Strike “mainly” as it’s use is mis-leading. Heritability estimates in referred journals and within companies do not support the use of this word. They are related but the % that is due to genetic effect versus environmental is less than ½ and for many is closer to zero.</p> <p>1196 After ‘problems’ add: ‘Since the SCAHAW report leg problems, ascitis and sudden death syndrome have decreased, which has become clear from the public data delivered from e.g. Denmark and Canada. Danish foot pad dermatitis reduced from 57% in 1999 to 0.7 % in 2005. In Canada over the same period ascitis reduced from 35 to 10%, arthritthis .9 - &lt;.2%; ascitis 35 – 10%).</p>	<p>‘Even if there are interactions between these factors, it is recognized that some welfare problems are related to genetic factors.’  ‘...major concerns for chicken welfare are the metabolic disorders resulting in leg problems, ascites and sudden death syndrome and other disorders such as footpad dermatitis. There are indications from Danish and Canadian sources that some of these (such as valgus-varus deformities or ascites measured on Canadian condemnation at slaughterhouse) have shown a decrease in recent years (according to data received in the public call for data) but this trend needs to be confirmed.(see chapter 3, EFSA Journal 2010; 8 (7):1666)</p>
<p>EFFAB, AVEC, EPB, Copa-Cogeca, NFU</p>	<p>5.14.2. Control options for airborne transmission of infectious agents from farms</p>	<p>1172 The relevance of this issue related to the mandate is not clear</p>	<p>High biosecurity regimes should be in place on farms and between farms to avoid transmission of infective agents. There is a lack of knowledge how far infective agents are transported in an airborne state. It is necessary to understand and define “safe distances” between</p>

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			farms. (see chapter 4.17, EFSA Journal 2010; 8 (7):1667)
EFFAB, AVEC, EPB, Copa-Cogeca, NFU	5.14. Infectious diseases	1095 Whole chapter 5.14. How do the mentioned individual figures relate to the total average mortality rates? 1112 Delete 'may' 1108 After 'stocks' add 'It is important to mention that, also when there are less diseases, and the welfare and management has improved, there will always be some diseases, and also always new diseases will emerge.' 1120 Replace '8-21' by '6-21' 1137 Delete 'by' 1162 After 'available' add 'Robustness characteristics are important traits in the current poultry breeding programmes (with over 40 traits).'	The following diseases are those that are more commonly observed. However, in general, infectious disease is not a major cause of mortality in broiler breeders. Technical corrections were done (see chapter 4.17, EFSA Journal 2010; 8 (7):1667)
EFFAB, AVEC, EPB, Copa-Cogeca, NFU	5.13. Training of stockpersons	1094 We can only underline the importance of training of stockpersons, and would like to add the importance of farmers' clubs. We also wish to stress that these activities can best be undertaken in a living transparent environment of farmers and their suppliers, as in that case the improvements and changes over time can be implemented most quickly.	Training of stock person is underlined. The way of performing training and importance of different points at that process are out of the scope of the mandates
EFFAB, AVEC, EPB, Copa-Cogeca, NFU	5.11. Egg peritonitis/Salpingit is in females	1082 Replace 'in' by 'is' 1085 After '2000' add 'The Canadian public data confirm this – peritonitis in Canada in 1999-2007 was around 1-2.5 %.'	Corrections were done. (see chapter 4.13, EFSA Journal 2010; 8 (7):1667)
EFFAB, AVEC, EPB, Copa-Cogeca, NFU	5.10. Leg weakness	1080 After 'required' add: 'The Canadian public data show improvements over time for all health related traits, also leg weakness and other bone related traits (e.g. from 1999-2007 arthritits .9 - <.2%; ascitis 35 – 10%; ). Although there are no such extensive European data, there is no reason to assume the situation would be worse in Europe – it does indicate the value of public comparable health data to monitor the health and welfare of animals'.	According to Hocking (2004), ligament and tendon ruptures in males have decreased from 1989 to 1998 but the picture is less clear for destructive cartilage loss. More recent data on the skeletal condition of feed



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			restricted broiler breeders in commercial flocks is required.(see chapter 4.12, EFSA Journal 2010; 8 (7):1667)
EFFAB, AVEC, EPB, Copa-Cogeca, NFU	5.9. Cage housing	<p>1062 The information from layers cannot be extended to broilers, that is speculative. For a scientific report wording like ‘reasonably assumed’ cannot be accepted, they say this in the absence of data.</p> <p>After ‘cages’ add: ‘In addition, although economic reality is not in the scope of the report, it is important to mention that the housing in cages is a way to manage small amounts of birds for special purposes, often special markets of slow growing birds. Here the diversity of the market is being weighed against the manageability of the (very expensive) breeding programme.’</p>	<p>It is stated that ‘.. birds may suffer’</p> <p>In Europe there are a small number of farms that have multi-tier cage systems („colony” cages) for broiler breeder parent stock during the production period, housing about 60-100 birds with nests, perches and natural mating but without litter.(see chapter 4.11, EFSA Journal 2010; 8 (7):1667)</p>
EFFAB, AVEC, EPB, Copa-Cogeca, NFU	5.7. Culling	<p>1016 Methods must be practical and legal based. Most countries will ask for stunning but death by bleeding is not practical and due to disease control not acceptable!</p> <p>1026-1027 Incorrect. This is not “related to culling”. It is a lack or mis-identification of sick or injured birds and is handled by proper training.</p>	<p>Methods of culling and reference to Council Regulation No 1099/2009<sup>16</sup> were presented in chapter 3.5 (EFSA Journal 2010; 8 (7):1667) Culling of birds, as opposed to letting them die, can be an indicator of improved welfare and health. (EFSA Panel on Animal Health and Welfare, 2010).(see chapter 4.9,</p>

<sup>16</sup> 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, p. 1–30*

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			EFSA Journal 2010; 8 (7):1667)
EFFAB, AVEC, EPB, Copa-Cogeca, NFU	5.5. Ammonia and dust	<p>992 We do not understand what this has to do with genetic selection in this part of the report.</p> <p>993-997 This is a matter of proper management and following the management guides. This is all controlled by proper water equipment maintenance and proper ventilation. If there is too much ventilation you will have dry and dusty conditions. If there is too little ventilation you will have wet conditions with too much ammonia.</p>	<p>Ammonia and dust items are points related to welfare of breeders</p> <p>Although high levels of ammonia and dust do have consequences for birds welfare, the levels needed for clinical changes are so high that non-animal-based outcome measures (e.g. ammonia and dust levels themselves) are probably more practical welfare indicators(see chapter 4.5, EFSA Journal 2010; 8 (7):1667)</p>
EFFAB, AVEC, EPB, Copa-Cogeca, NFU	5.4. Environmental enrichment	<p>952 We do not understand what this has to do with genetic selection in this part of the report.</p> <p>959-963 Delete ‘In the absence of data it can be reasonably assumed that the motivation to perch and the use of perches does not differ between laying hens and broiler breeders’ The birds are totally different, and it is speculative. For a scientific report wording like ‘reasonably assumed’ cannot be accepted, they say this in the absence of data.</p>	<p>Environmental enrichment is related to welfare of breeders.</p> <p>‘In the absence of data for broiler breeders it may be assumed that the motivation to perch and the use of perches does not differ much between laying hens and restricted fed broiler breeders.’ (see chapter 4.5, EFSA Journal 2010; 8 (7):1667)</p>

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<p>EFFAB, AVEC, EPB, Copa-Cogeca, NFU</p>	<p>5.3. Mutilations</p>	<p>884 Delete ‘In some countries mutilations are standard practice in broiler breeders management but sometimes they are carried out as a matter of tradition.’ And replace by ‘From the information provided by the breeders it became clear that interventions only take place when it is to prevent other more severe welfare issues and when there is no alternative. Any intervention has been decreasing heavily or is not existent anymore in Europe.’</p> <p>891 Are there really practical methods to apply this?</p> <p>893 Insert after ‘females.’ ‘According to article 21 of the Recommendations concerning domestic fowl (Gallus Gallus) of the Council of Europe exceptions to this prohibition may be made on a case by case basis by the competent authority only in respect of the following procedures:</p> <ul style="list-style-type: none"> <li>- removal of the tip of the beak;</li> <li>- in the case of male breeding birds, the removal, within the first 72 hours of life, of the first phalanx of the toe directed backwards and that of the inside toe;</li> <li>- dubbing (removal of part of the comb) within the first 72 hours of life’</li> </ul> <p>904-909 Delete ‘The procedure may involve acute distress from handling, and pain and distress from performing the beak trimming procedure. In addition, it deprives the bird from important sensory feedback from its beak. It can have harmful neuro-anatomical consequences: although tissue damage is repaired the sensory receptors are not replaced, and neuromas may be formed and become a source of chronic pain.’ As it is not relevant – birds are being beak trimmed before neuromas are formed.</p> <p>920 The reduction in body weight is temporarily. It is important to remind that interventions only take place when there is a net welfare benefit.</p> <p>932 After ‘Dennis et al, 2009)’ add : ‘Broiler chicks are beak trimmed at 3-9 days of age, increasingly at the hatchery, and increasingly (this is the majority) by the infrared method. Where the hot blade method is applied, this is done by specifically trained personnel (e.g. Netherlands). (information from the breeders)’.</p>	<p>In some countries mutilations such as beak trimming, de-toeing, de-spurring and comb dubbing are standard practices in broiler breeder management in order to avoid injuries but sometimes they are carried out more as a matter of habit and routine management practice. However, practical strategies to relieve the pain and subsequent discomfort have yet to be developed. It was presented information why not mutilating the birds may also lead to reduced welfare, especially in the females.(see chapter 4.3, EFSA Journal 2010; 8 (7):1667)</p> <p>It was decided to keep the explanation of the procedures. Clarification in the comparison of body weight was added.(see chapter 4.3.1, EFSA Journal 2010; 8 (7):1667)</p> <p>In general, infrared beak trimming seems to be slightly better for welfare compared with beak trimming using an electro-cautery device (Gentle and</p>

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		945 Add: 'Despurring is not a universal breeder recommendation.'	<p>McKeegan, 2007; Henderson et al., 2009, Dennis et al., 2009), although the opposite has also been found (Marchant-Forde et al., 2008). (see chapter 4.3, EFSA Journal 2010; 8 (7):1667)</p> <p>The extent to which each mutilation, and the methods used, is carried out in EU member states is not known. Because of its implications for welfare, data on the prevalence of beak trimming, de-toeing and despurring and the methods used should be collected as well as studies for their need.</p> <p>(see chapter 4.3, EFSA Journal 2010; 8 (7):1667)</p>

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<p>EFFAB, AVEC, EPB, Copa-Cogeca, NFU</p>	<p>5.2. Aggression</p>	<p>859-862 Synchronisation of males and females is a management issue and mis-management can lead to many welfare issues. The key point is to use and follow management guides.</p> <p>869 After "(Duncan, 2009)". include: 'For that reason, the parent stock males are being declawed (see chapter 4.2) but only at the hatchery by trained personnel'.</p> <p>874-877 Although male aggression in broiler breeders has not changed (Sullivan, 2009, answer to the public call for data), there is variation within pure lines and between lines with regard to male aggressiveness. Male aggression and mobility can be linked to traits such as fertility, but is easily evaluated in pedigree pen evaluation using multi-trait evaluation of traits such as hen feather condition, fertility and performance of relatives.</p> <p>880-881 There are two misunderstandings about spiking. 1. The reason that spiking leads to altered behaviour is because you are disrupting the pecking order that was established in the flock. The same thing is seen when native flocks come together. A re-establishment of pecking order/dominance has to occur. 2. Spiking does not always lead to aggression, often you can avoid, it depends on the way you mix new males. There are management techniques that allow to keep the risk of aggression under control, e.g. progressively mixing males and females (step by step). If management guides are being followed many of the problems can be avoided (weight of males and sexual maturity).</p>	<p>'Inadequate management may lead to males reaching sexual maturity earlier than females.'</p> <p>It was decided to keep presenting the rough behaviour (Duncan, 2009) and what it may lead to.</p> <p>'...answer to the public call for data) indicated that mating aggressiveness is to be one of the selection points for breeders, and such a trait can be positively linked to traits such as fertility</p> <p>'..spiking may also lead to increased aggression...'</p> <p>(see chapter 4.2, EFSA Journal 2010; 8 (7):1667)</p>
<p>EFFAB, AVEC, EPB, Copa-Cogeca, NFU</p>	<p>5.1. Feed restriction</p>	<p>784 – 853 There are many conflicts in this paragraph. These need to be resolved. It is not doable to react to the individual sentences.</p> <p>Furthermore, there is a principle misperception on ad libitum feeding.</p> <p>Ad lib is feed available any time. Because of that they get bigger. Because of that they need more. Etc etc Therefore it is completely incorrect to design a % of ad lib feed as feed for an animal as a good feed of what you should give them. The argument we bring in here is against the paper, not against the reference.</p> <p>Diets are designed for the stage and purpose in life, and are matched to production, body weight and conformation needs at these points in time.</p> <p>Feeding an animal ad libitum is an irrelevant situation. No other animal gets ad lib feed.</p> <p>Cattle and sheep are on store rations, for keeping them through the winter, they loose weight. But unlike other farmed animals at no point do individual broilers loose weight.</p>	<p>The text was modified (see chapter 4.1, EFSA Journal 2010; 8 (7):1667)</p> <p>'Not restricting the feed will cause welfare problems because of the high body weights of non- restricted standard birds including increased premature death.'</p> <p>'Alternative feeding strategies, like diet dilution and appetite suppressants, do</p>

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		They maintain a constant targeted body weight increase. The weight of the broilers on feed regimes increases.	not clearly benefit broiler breeder welfare'(see chapter 4.1, EFSA Journal 2010; 8 (7):1667)
EFFAB, AVEC, EPB, Copa-Cogeca, NFU	4.9. Slow growing breeds and systems of production	733 The WG are mixing up dwarf, coloured and slow growing, they should rewrite the chapters 4.8 and 4.9.	Medium to slow growing alternative breeds s(see chapter 3.8, EFSA Journal 2010; 8 (7):1667)
EFFAB, AVEC, EPB, Copa-Cogeca, NFU	4.8. Mini (or dwarf) hens	<p>711 The WG are mixing up dwarf, coloured and slow growing, they should rewrite the chapters 4.8 and 4.9.</p> <p>712 – 716 Strike ‘1.5-1.9 kg at 18 weeks of age and 1.6-2.3 kg at the end of the production period for coloured hens, and’ and ‘the other’ as this is irrelevant. It will be addressed in par 4.9 (slow growing breeds)</p> <p>716-717 Change ‘leads’ into ‘may lead’ , and delete ‘and percentage of males (up to 9%)’</p> <p>717-719 Change ‘may be ‘ by ‘is’ . Otherwise it is misleading</p> <p>723 The first was commercial in 1968, and there is an earlier paper than the Sorensen: J. Guillaume. 1976. The dwarfing gene dw: its effects on anatomy, physiology, nutrition, management. Its application in Poultry Industry. Worlds Poultry Science Journal. 27, 285-303.</p> <p>726 After ‘2006). This is not true, all companies who developed dwarf females are still marketing them. The next sentences contradict the Duncan and Forkman article. Skip ‘anymore’</p> <p>725 – Delete ‘slightly’ as this does not add any information</p> <p>730-731: Delete ‘ If an alternative to feed restriction has to be found, the use of a dw genotype with less severe feed restriction could be adopted. Some of the „mini, breeder</p>	<p>Medium to slow growing alternative breeds was redrafted (see chapter 3.8, EFSA Journal 2010; 8 (7):1667)</p> <p>Mini-hens represent 18-20% of parental stock in Europe and the majority of parental stock in some countries such as France.</p> <p>Housing and management of broiler breeders</p> <p>The main reason for using mini-females is that they are of smaller size and have lower feed consumption.</p> <p>Their offspring grow slower compared with classical hen offspring, which may reduce health and welfare problems linked with very fast growing birds.</p>

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		<p>birds (but not the majority) are housed in cages. ‘ as this is a statement going beyond the scope of chapter 4 as explained in line 275 by ‘The following sections set out a general description of the housing and management of broiler breeders in EU member states’, and is without a basis. The Decuypere paper does NOT suggest this. More research is needed.</p>	<p>(see highlights after chapter 3.8, EFSA Journal 2010; 8 (7):1667)</p>
<p>EFFAB, AVEC, EPB, Copa-Cogeca, NFU</p>	<p>4.7. Abattoir issues</p>	<p>697 – 701 Replace ‘Finally --- facilities’ by ‘Finally, the birds are transported to a slaughterhouse. There are specific abattoirs for broiler breeders but the number of broiler breeders in the MSs is very different and therefore the situation differs across the EU-27; instead there are plants that can slaughter broiler breeders, spent laying hens, broilers and sometimes turkeys. As most standard broiler abattoirs will not be prepared to slaughtering broiler breeders, they may have to be transported for long distances to reach suitable slaughter facilities.’</p> <p>702 – 709 ‘The most commonly ... similarly to the female birds.’ What is the source of this information?  ‘as this will create a welfare problem for heavy breeders’, has to be deleted since in line 1043 is said ‘There is no literature available describing these likely adverse effects on the welfare of broiler breeders.’ It is not likely that slaughterhouses want to receive (and pay for) animals that have to be culled and discarded.</p> <p>703-710 What about CO2</p>	<p>Finally, the birds are transported to a slaughterhouse. There are rarely specific abattoirs for broiler breeders; instead, these plants can slaughter broiler breeders, spent laying hens, broilers and sometimes turkeys. As some standard broiler abattoirs will not slaughter broiler breeders, they may have to be transported for long distances to reach suitable slaughter facilities. See chapter 3.7 EFSA Journal 2010; 8 (7):1667)</p>

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			<p>There is no literature available specifically describing the welfare of broiler breeders during transport and slaughter but the same basic principles as for other types of hens will apply. (see chapter 4.10, EFSA Journal 2010; 8 (7):1667)</p> <p>Controlled atmosphere stunning (e.g. two-phase carbon dioxide, argon) is an alternative method that would avoid shackling (See chapter 3.7, EFSA Journal 2010; 8 (7):1667).</p>
<p>EFFAB, AVEC, EPB, Copa-Cogeca, NFU</p>	<p>4.5. Culling methods</p>	<p>662 Methods must be practical and legal based. Most countries will ask for stunning but death by bleeding is not practical and due to disease control not acceptable!</p> <p>668 Change 'some countries (Sweden) by ' various countries'</p> <p>670 (Council Regulation (EC) No 1099/2009' add 'to be applied from 1 January 2013"</p> <p>672 3 should be 5 kg</p> <p>675 'culling' should be 'stunning'</p> <p>677 instead of 'handheld electrical stunner, followed by death by bleeding', should be: 'electrical stunning followed by death by mechanical cervical dislocation. '</p>	<p>Methods of culling and reference to Council Regulation No 1099/2009 were presented in chapter 3.5 and Corrections were done. (See chapter 3.5, EFSA Journal 2010; 8 (7):1667)</p>



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<p>EFFAB, AVEC, EPB, Copa-Cogeca, NFU</p>	<p>4.4.2. Management during the production period</p>	<p>566 ‘numbers hatching’. Is this meant to say hatching egg numbers or chicks hatching?            567 Replace ‘eating up time’ by ‘feed clean-up time’            569 Replace ‘as housing’ by ‘as in house’            570 Replace ‘culled and,’ by ‘culled, and’            604 Change ‘3,8-4’ in ‘3.5’ (see also ‘3,5’ in line 715 !)            604 Change ‘5-6 kg at 60 weeks for males’ into ‘ 4,8 – 5 (max.!) at 60 weeks for males’.            605 After ‘females’ add: ‘It is important to mention that, although economic aspects are not the aim of this report, lower stocking densities need to be ‘covered economically’ by higher prices, and compete against imports from outside Europe. If regulatory stocking density is not allowing poultry breeding for economic reasons, imports (with other welfare requirements, and non European welfare control) will replace European poultry production, depending on the severeness of the legal requirements in Europe. As indicated in the Advisory Council Report of the Welfare Quality project “And of course, EU legislation cannot be enforced on producers in countries outside Europe. It must be expected that imported produce will play a more important role in the EU market due to the additional costs of European products, including costs involved in farming to high welfare standards in the EU. The animal welfare conditions in those exporting systems must be brought under firm control if the whole system is to have any credibility. This can only be done through qualification schemes.”’            609 There is a principle misperception on ad libitum feeding.            Ad lib is feed available any time. Because of that they get bigger. Because of that they need more. Etc etc Therefore it is completely incorrect to design a % of ad lib feed as feed for an animal as a good feed of what you should give them. Diets are designed for the stage and purpose in life, and are matched to production, body weight and conformation needs at these points in time.            Feeding an animal ad libitum is an irrelevant situation. No other animal gets ad lib feed. Cattle and sheep are on store rations, for keeping them through the winter, they loose weight. But unlike other farmed animals at no point do individual broilers loose weight. They maintain a constant targeted body weight increase. The weight of the broilers on feed regimes increases.            611 Replace ‘1 h’ by ‘ 30 minutes’, and replace ‘5-7’ by ‘5-8 (recommended up to 8)’            650-651 The part about spiking should be deleted here, as it must be at 878</p>	<p>The text was modified and corrections incorporated</p> <p>Policy in the economic aspects is out of the scope of the mandate.</p> <p>‘If broiler breeders were fed standard broiler diets ad libitum during their entire life, like commercial broilers, they would grow too rapidly and become far too heavy to maintain good health before reaching the age of sexual maturity.</p> <p>(see chapter 3.3.2 and 3.3.2.4 EFSA Journal 2010; 8 (7):1667)</p>

ORGANISATION	CHAPTER_TEXT	COMMENTS_TEXT	COMMENTS_DEAL
<p>EFFAB, AVEC, EPB, Copa-Cogeca, NFU</p>	<p>4.4.1. Housing during the production period</p>	<p>503 Replace ‘18-20’ by ‘18-22’            504 Delete ‘, as opposed to,’ as this does not add            508 Replace ‘fewer’ by ‘lower’. ?            514 After ‘windowless’ add, ‘because...’ see above            Replace ‘force-ventilated’ by ‘mechanically ventilated’            516 After ‘schedule’ add ‘In open houses there is more risk for animals being injured by other animals. Light control keeps unwanted behaviour low. Light intensity is agreed by law. Broiler breeders retain juvenile and adult photorefractoriness and therefore require control of daylength to respond naturally. There have recently been advances in the understanding of lighting-day length- affects on breeding of meat chickens. (Lewis and Morris, 2006; Lewis, 2009).            In particular the full understanding of both Juvenile and Adult Photorefractoriness explain many of the previous difficulties of controlling sexual maturation. In particular the need to ensure complete light control and hence provide short days during the rearing period when breeders are grown in all seasons of the year—this would specifically preclude the use of windowed houses for summer rearing in Northern Europe with extremely long summer days. ‘              520 After ‘houses’, add ‘ – these might encourage aggressive behaviours. ‘            521 – delete ‘at’            521 ‘Multi-Tier’ should be ‘Veranda®’.            525 after ‘France’, add ‘Poland’            526 “have mini breeder hens ... “ : not true , housing in conventional cages can be the case for both Standard and Mini breeders (e.g. in Poland)              554 Most countries use mash, not pelleted feed. Change ‘pelleted’ by ‘mashed’ and strike ‘(in France and the UK mash is used)’            557 Replace ‘the feed racks’ by ‘the female feed tracks’</p>	<p>Text in the chapter was modified and corrections incorporated.</p> <p>‘From day 1, when the birds are placed in the house, until 16-21 weeks of age when they are transferred to the production unit, they are kept in single-sex groups’. The standard broiler breeder rearing unit houses in Europe are mechanically ventilated and window- less (Hocking, 2004).</p> <p>No enough data for a statement that ‘open-sided layer houses might encourage aggressive behaviours’</p> <p>‘multi-tier battery cages for rearing broiler breeders’ was preferred instead of trade name.</p> <p>‘Feed, which is either pelleted or mash, is provided on feeder tracks or in feeder pans.’ (see chapter 3.4.1, EFSA Journal 2010; 8 (7):1667)</p>
<p>EFFAB, AVEC, EPB, Copa-Cogeca, NFU</p>	<p>4.3.2. Management during the rearing period</p>	<p>390 – ‘the is’ should be removed              413 After ‘maturity.’ add ‘It is important to mention that the birds are not being</p>	<p>Correction was done              ‘Birds are feed-restricted in</p>

ORGANISATION	CHAPTER_TEXT	COMMENTS_TEXT	COMMENTS_DEAL
		<p>restricted to such an extent that they are not reproductive anymore – they get less than their maximum appetite.’</p> <p>413-414 ‘This would have detrimental effects on their health, their fertility and their welfare (see Decuypere et al., 2006).’ Needs to be struck since welfare aspects are to be presented in chapter 5 as mentioned in line 417 by ‘The negative welfare aspects of imposing feed restrictions are discussed below.’</p> <p>420 After ‘feeding’ delete ‘or skip two days’ . There are never two days skipped subsequently. Skip two days are NEVER used.</p> <p>437 After ‘animal species.’ include ‘ Benefits are still incompletely defined.’</p> <p>468 Replace ‘Litter’ by ‘Bedding’ 469 Replace ‘Litter’ by ‘Bedding’</p> <p>480 – ‘only MD’ is not correct: Replace ‘only MD vaccine is given as an injection, and the first dose is normally given at the hatchery’ by ‘There are more vaccines being given by injection ( MD, IB,ND,IBD,Reo,ART, Salmonella) during the rearing period mainly on two different ages at the end of the first and second half of the rearing time. ‘</p> <p>488 Replace ‘From one day-old’ by ‘From day-old’</p> <p>494 – Legislation – It might be better to include a more general chapter on legislation and recommendations in Chapter 4 before paragraph "4.1. Hatching" than to have it in this chapter "4.3.2 Management in the rearing period". In this part all legislation might be mentioned related to management (including mutilations), housing, transport etc. (e.g. Directive 98/58 – Recommendations concerning domestic fowl (Gallus Gallus) of the Council of Europe, Directive 93/119, Regulation 1099/2009)</p> <p>500 At the end should be included: Not only legislation but also the Recommendations concerning domestic fowl (Gallus Gallus) of the Council of Europe are relevant. But it is</p>	<p>accordance with set programs throughout rearing to limit growth rate and body weight and to achieve desired levels of fertility.’(see highlights in chapter 3.3.2. EFSA Journal 2010; 8 (7):1667)</p> <p>The working group decided to list detrimental effects with the feeding regimes. Corrections were done. It was decided only to present particular requirements ‘In Sweden and UK a daily feeding regime is required. (see 3.3.2.4, EFSA Journal 2010; 8 (7):1667)</p> <p>The working group agreed to keep the wording.(see 3.3.2.8, EFSA Journal 2010; 8 (7):1667)</p> <p>‘but some are given by injection’(see 3.3.2.9, EFSA Journal 2010; 8 (7):1667)</p> <p>Editorial change done.</p> <p>The quotation to the legislation was linked to the discussion on specific issues. (see 3.3.2.11, EFSA Journal 2010; 8 (7):1667)</p>

ORGANISATION	CHAPTER_TEXT	COMMENTS_TEXT	COMMENTS_DEAL
		<p>a general misunderstanding that very detailed legal requirements would always promote the welfare better than outcome based rules or recommendations. Thus, after line 500, add: ‘However, detailed housing and management descriptions in law would quickly be outdated, and are vulnerable as they can not take on board the housing and management improvement over time. The detailed management guides of the breeding companies provide finetuned guidelines for the birds and are being updated on a regularly basis. Considering the improvements in welfare shown via the public data, it may be more effective to invest in public comparable data instead of in law.’</p>	<p>The issues of outcome based rules or recommendations were addressed in chapter on indicators used in practice (see chapter 5, EFSA Journal 2010; 8 (7):1667)</p>
<p>EFFAB, AVEC, EPB, Copa-Cogeca, NFU</p>	<p>4.3.1. Housing during the rearing period</p>	<p>335 Replace ‘16 to 18-20’ by ‘16-21’ 337 Replace ‘20,000’ by ‘10,000’. The minimum house number indicated is not adequate, many producers put less than 20,000 hens, lower end needs to be changed to 10.000.</p> <p>338 Replace ‘force-ventilated’ by ‘mechanically ventilated’ 339-340 After ‘windowless (Hocking, 2004)’ add ‘Although windows may be covered (see 516)’.</p> <p>359 Replace ‘not’ by ‘instead of’. 366-373 Spin feeders are not primarily used as the first sentence indicates. Tracks, pans and spin feeders are used. Spin feeder is a way to feed birds, not a tool to do enrichment. Spin feeders cannot be used in many locations due to the feed mills inability to make a hard enough pellet. If spin feeding is not applied correctly, increased scratching is seen with spin feeders as well as increased cocci infections as a result of the forced “foraging behaviour”. There is no preferred method, none is universally positive. With all these systems, if you do not apply it properly you get into problems. Management guides are important and to be followed.</p>	<p>The information was taken into account.</p> <p>Editorial corrections done.</p> <p>‘The standard broiler breeder rearing unit houses in Europe are mechanically ventilated and windowless (Hocking, 2004).’</p> <p>‘..is provided on feeder tracks or pans or scattered on the floor, commonly using so called „spin feeders“ for pelleted feed, to encourage uniform feed intake.’ (see chapter 3.3.1, EFSA Journal 2010; 8 (7):1667)</p>

ORGANISATION	CHAPTER_TEXT	COMMENTS_TEXT	COMMENTS_DEAL
EFFAB, AVEC, EPB, Copa-Cogeca, NFU	4.2. Mutilations	<p>The submissions made on Background, Acknowledgements, Scope, Introduction to breeding industry and their activities, Housing and management, Hatching, sent in earlier this morning are also on behalf of NFU.</p> <p>AVEC = Association of Poultry Processors and Poultry Trade in the EU countries            COPA-COGECA = European Farmers and European Agri-Cooperatives            EFFAB = European Forum of Farm Animal Breeders            EPB = Association of the European Poultry Breeders            NFU = National Farmers Union</p> <p>301 After 'hybrid' add: 'and which are perceived to give a net welfare benefit'            A lot of research has been undertaken to minimise any interventions to poultry. Interventions that still are commonly applied like beak trimming or declawing are so for the net welfare benefit.</p> <p>307 Replace 'carried' by 'performed'            308 After 'hatchery', add: 'by trained personnel.'            324 Replace 'may be' by 'is'            331 'In some MS beak trimming is banned (e.g. Sweden, Finland).' Should be deleted since it is superfluous and a repetition of what is said in footnote 4 on page 9.</p>	<p>The comment was considered and it was decided that no action is required</p> <p>The welfare aspect of mutilations were addressed in chapter 4.3 (EFSA Journal 2010; 8 (7):1667)</p> <p>Editorial corrections done</p>
EFFAB, AVEC, EPB, COPA-COGECA	4.1. Hatching	<p>293 Replace 'unwanted' by 'rejected'. In a broiler operation, all chicks which are culled are sick or weak or malformed. None are unwanted. The off-sex will be raised as broilers.</p> <p>294 delete 'a method often used ...production)'. This is a tendentious and unnecessary sentence. There is no reason to include this sentence.</p>	<p>Corrections were done, see chapter 3.1 (EFSA Journal 2010; 8 (7):1667)</p>

ORGANISATION	CHAPTER_TEXT	COMMENTS_TEXT	COMMENTS_DEAL
<p>EFFAB, AVEC, EPB, COPA-COGECA</p>	<p>4. Housing and management of broiler breeders (parents and grandparents)</p>	<p>272 It should also be mentioned that there is no special directive or regulation for keeping breeders for meat production. And there are the recommendation of the European council, which has a short part for meat type breeders, and the European Council directive 98/58 on farming animals.</p> <p>273 Replace “There have been no major changes in the housing and management of broilers since the SCAHAW (2000) report’ by “This chapter aims to give an overview of the types of housing used in poultry production, and about the way poultry are being managed. It also describes into detail possible welfare problems that have been reported and investigated in the past (SCAHAW report, 2000), so as to give a full picture of all possible welfare problems and of the factors that should be taken into account; ‘ It is not true that after the SCAHAW report nothing has changed, various improvements are being mentioned in the report (lines 591-594 on the decreases in mortality over time), and also current data on feed restriction give other results than data from 1993-2002, pointing towards improved conditions for the feed restricted animals. Interventions have decreased heavily and where they are still taking place, it is to improve the net welfare benefit. After ‘this report should serve as a background reference.’, add: The aim of this chapter is not to give the impression that these possible welfare issues have not improved over time – the aim is also to show how the individual welfare problem indications as referred to in the literature from the 60s, 70s, 80s and 90s of the previous century have been taken up and improved by the animal breeders and producers, and have lead to the welfare improvements as shown from the public Danish, Agristats, Canadian, French data.</p> <p>276 After ‘states’, add: There is no special directive for keeping breeders for meat production, only general welfare directives.</p> <p>282 Adapt the sentence to ‘Section 4.8 refers to mini and Section 4.9 refers to ‘other systems of management’”</p>	<p>Breeders kept for meat production are out of the scope of mandate. See Terms of Reference (EFSA Journal 2010; 8 (7):1667)</p> <p>The paragraph was rephrased to address the comments. (see chapter 3, EFSA Journal 2010; 8 (7):1667)</p> <p>Information on policies of breeding companies regarding selection for welfare versus production was presented in chapter 5.6. (EFSA Journal 2010; 8 (7):1666)</p>

ORGANISATION	CHAPTER_TEXT	COMMENTS_TEXT	COMMENTS_DEAL
EFFAB, AVEC, EPB, COPA-COGECA	3. Introduction to the breeding industry and their activities	<p>237 'Industry' to be replaced by 'sector'</p> <p>243 This sentence it is not correct. Replace 'grandparent' by 'pedigree' and strike 'also known as pedigree stock'</p> <p>244 There are two different bases for the figures. This is about the general status. The link with Figure 2, page 40 is not correct, and should be struck.</p> <p>248 – 'the three' should be 'three'</p>	<p>Editorial changes done. (See appendix A, EFSA Journal 2010; 8 (7):1666 and Appendix A, EFSA Journal 2010; 8 (7):1667)</p>
EFFAB, AVEC, EPB, COPA-COGECA	2. Scope and objectives	<p>222 We were particularly concerned that the initial mandate specifically excluded social and economic aspects which would have a significant influence on the outcome of this exercise.</p> <p>223 We would like to emphasise that</p> <ol style="list-style-type: none"> <li>1) always real animal welfare should prevail over perceived welfare,</li> <li>2) democratic welfare (the total amount of welfare of many animals) should not be sacrificed for happy few animals welfare, and,</li> <li>3) importantly, we should not export the problem. If we estimate that in its unpolished maximum form European poultry production will severely be diminished on the cost of imports, the overall animal welfare must be considered, and not the welfare of the few broilers that still will be left in Europe.</li> </ol> <p>Furthermore, we have a global responsibility for food production and environment. There is a demand driven livestock revolution taking place, which will continue to take place the next 25 years. People in upcoming economies will eat more meat, starting with chickens. This can only be met in a sustainable way, if done efficiently and in a balanced way. That current knowledge to achieve this is in Europe and North-America</p> <p>231 'the breeding industry' to be replaced by 'poultry breeding sector'</p> <p>236 'industry' to be replaced by 'breeders'</p>	<p>Social, ethical and economic aspects are out of EFSA and they are the remit risk managers. Editorial changes done.</p>

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<p>EFFAB, AVEC, EPB, COPA-COGECA</p>	<p>1. Introduction</p>	<p>214 ‘It is generally accepted that’ to be replaced by ‘There is a perception that’</p> <p>217 The literature referred to in chapters 4-6 heavily leans on the SCAHAW report of 2000. The developments in poultry breeding and poultry breeding have shown to have improved welfare importantly and continuously. This means that the individual welfare problem indications as referred to in the literature from the 60s, 70s, 80s and 90s of the previous century have been taken up and improved by the animal breeders and producers. Therefore, they give an unjustified negative picture of poultry breeding and production. The chapters should therefore refer to these improvements, in the introductions and in the conclusions, indicating the intention to give a complete overview of all the factors that should be taken into account and what can go wrong, but also that the knowledge developed has been put into practice.</p> <p>217 Include ‘in the last century’ after ‘welfare problems’.</p> <p>217 After” Bessei, 2006”, include ‘and the working groups wish to investigate how the welfare has developed over time.’ Main reference or focus based on Bessei’s report which is not more than a literature summary or a more or less modern update of the SCAHAW 2000 scientific report</p> <p>219 ‘It is generally accepted that’ is a tendentious negative sentence, as also improvements of animal welfare by genetics and husbandry since the last 20-30 years will (and have) improve(d) welfare. There are two possibilities: take this sentence out, or include ‘but this also implies that improvements in genetics and environment will improve welfare – the aim of this report being to investigate how this has developed over the last 15 years, and is expected to develop in the future’.</p> <p>If we assume it is the intention to improve welfare, we should be open to what are the pitfalls, but also work towards solutions, and be open about the solutions that have been found and implemented. To our opinion this has only partly been the case. Although we wish to understand the desire to write out some parts into detail, one has to realise that it might lead to actions which will be counterproductive, e.g. extra laws. We sincerely fear that wrong conclusions could lead to unjustified possible measures - actions that will put many European poultry farmers out of business.</p> <p>Whilst other actions, like transparent public comparable data would serve both the public and the farmers and breeders working with the chickens.</p>	<p>Editorial comment done</p> <p>The working group use most up-to-date information. To address the issue EFSA organised a call for data, stakeholder and public consultation. (See chapter Consultation in this technical report)</p> <p>Information on policies of breeding companies regarding selection for welfare versus production was presented in chapter 5.6. (EFSA Journal 2010; 8 (7):1666)</p> <p>The information was taken into account, to address the comments the introduction chapter was rephrased. (See chapter 1, EFSA Journal 2010; 8 (7):1666 and chapter1, EFSA Journal 2010; 8 (7):1667) For statements of the AHAW Panel (See conclusions and Recommendations, EFSA Journal 2010; 8 (7):1666 and EFSA Journal 2010; 8 (7):1667)</p>



ORGANISATION	CHAPTER_TEXT	COMMENTS_TEXT	COMMENTS_DEAL
<p>EFFAB, AVEC, EPB, COPA-COGECA</p>	<p>Acknowledgements</p>	<p>195</p> <p>1. Quality document</p> <ul style="list-style-type: none"> <li>- We are disappointed in the quality of the document at this stage, due to very poor attention to detail, e.g. references missing, references repeated, typographical and spelling errors. All of these result in a document which is difficult to comment upon constructively.</li> <li>- All references which are used must be shown in the text and in the table of references so that everybody is able to check the content.</li> </ul> <p>2. Inconsistency and repetition</p> <ul style="list-style-type: none"> <li>- The report shows clear evidence of multiple authorship which would explain why some of the arguments show inconsistency through the document.</li> <li>- Sometimes there is a repetition of stances, statement or conclusions in the draft opinion</li> <li>- Because of these many repetitions, to be clear we have been including remarks at many places as well, when there were contradictions</li> </ul> <p>3. Unjustified speculations</p> <p>The document very frequently introduces a topic with [may be] , and the tentative links are given equal weight to more factual data. At this short notice we have not been able to identify ALL the places where this has been taking place in the document, some are indicated. Where the draft opinion is referring to thoughts or ideas which are not or not sufficiently scientific based, it would be better to say that clearly and trying to avoid to keep the thought or idea alive. The draft opinion might have dealt more with data.</p> <p>4. Future research</p> <ul style="list-style-type: none"> <li>- Future research needs to work towards providing solutions</li> <li>- It should not be continuing the focus on describing negative aspects of behaviour/welfare without offering practical solutions</li> <li>- The document indicates the need for good/consistent broad based (internationally comparable) data collection to evaluate the genotypes in the commercial production systems</li> <li>- This is essential for correct evaluation of breeding strategies and their outcomes.</li> </ul> <p>The management of poultry is important, and needs care and professionalism. Therefore, the management guides of the breeding companies that are being updated continuously to the latest findings serve their purpose. It also includes that science needs to indicate in its reports up to what extent the management guides have been followed and to what extent and for what reason the investigation deviated from proper management rules.'</p>	<p>The text was modified.</p> <p>Opinions were checked for inconsistency, appropriate scientific support for presented statements, cross-checked for citations and references in the list, and checked for typographical and spelling errors before publication.</p> <p>The theme of further research was addressed (see recommendations and recommendations for future research ( EFSA Journal 2010; 8 (7):1666 and EFSA Journal 2010; 8 (7):1667)</p>

ORGANISATION	CHAPTER_TEXT	COMMENTS_TEXT	COMMENTS_DEAL
EFFAB, AVEC, EPB, COPA-COGECA	Background as provided by the Commission	<p>List of Tables, Line 110 After 'EFFAB' include 'and EPB'</p> <p>145 The initial remit for this exercise may have determined the emphasis on negative behavioural aspects of welfare, rather than solutions. The attention to negative welfare aspects and the attention to positive welfare aspects has to be better balanced. For that reason we have included suggestions in the text by linking improvements directly to where negative welfare aspects are mentioned.</p>	<p>The text was modified according to comments</p> <p>The background information was provided by the Commission. The statements of the AHAW Panel are based on the scientific information provided by the working group experts in the opinion and are presented in conclusions and recommendations (EFSA Journal 2010; 8 (7):1666 and EFSA Journal 2010; 8 (7):1667)</p>
K.U.Leuven	4. Housing and management of broiler breeders (parents and grandparents)	<p>4. Housing and management of broilers</p> <p>Risk temperatures related to health and welfare are documented, but no guidelines are formulated with respect to how to realize the required temperatures (e.g. ventilation capacity, air flow patterns, ...). This is important information for all stakeholders in order to evaluate the functioning of housing systems.</p>	<p>The comment was considered and it was decided that no action is required.</p>
University of Milan	9.1. Indicators used in practice	<p>2126 page 50-69:</p> <p>The knowledge of the chicken genome (Wallis et al., 2004 ) improved the concept of marker assisted selection, molecular biomarkers indicating stress related genes activity, for example, could be used as powerful early indicators (Marelli et al., 2010).</p> <p>Marelli SP, Terova G, Cozzi MC, Lasagna E., Sarti FM, Guidobono Cavalchini L. Gene expression of Hepatic Glucocorticoid Receptor NR3C1 and correlation with Plasmatic Corticosterone in Italian Chickens. <i>Animal Biotechnology</i>, 21: 140-148</p> <p>Wallis JW, Aerts J, Groenen MAM, Crooijmans RPMA, Layman D, Graves TA, Scheer DE, Kremitzki C, Fedele MJ, Mudd NK, Cardenas M, Higginbotham J, Carter J, McGrane R, Gage T, Mead K, Walker J, Albracht D, Davito J, Yang S, Leong S, Chinwalla A, Sekhon M, Wylie K, Dodgson J, Romanov MN, Cheng H., de Jong PJ, Osoegawa K, Nefedov M, Zhang H, McPherson JD, Krzywinski M, Schein J, Hillier L,</p>	<p>'Recently, DNA-array technology has enabled the large scale genotyping of individual animals/birds simultaneously for tens of thousands of DNA markers, paving the way for the so-called genomic evaluation and selection (Meuwissen et al., 2001). Genomic selection is rapidly becoming a very useful tool to identify birds which naturally carry desirable</p>

ORGANISATION	CHAPTER_TEXT	COMMENTS_TEXT	COMMENTS_DEAL
		<p>Mardis ER, Wilson RK, Warren WC. A physical map of the chicken genome. Nature 2004, 432:761-764.</p>	<p>genes.’ (see chapter 5.4, EFSA Journal 2010; 8 (7):1666)</p>
<p>The Hebrew University</p>	<p>6. Overview of the welfare of broilers</p>	<p>Lines 1199: The word "direct" should be changed to "indirect" with regards to most welfare problems. The more rapid growth of contemporary broilers (following successful breeding), which is the key to more efficient production (essential to making poultry meat an affordable meat even to the poor, and to save on global resources by improving FCR!), is not the cause of genetic skeletal and metabolic problems. The rapid growth is merely an extra load that exposes EXISTING genetic variation in skeletal and metabolic characteristics that were unnoticed (subclinical?) under lower growth rate. The lack of true genetic association between growth rate and skeletal disorders such as TD has been proven by data from many flocks (such as in Figure 3). Lack of association between growth rate and susceptibility to ascites was also demented in several studies, e.g., Druyan et al. 2008 (already in the list of References) and Ozkan et al. 2010 (I wrote the reference in a previous comment). Once an efficient tool for selection against susceptibility to ascites will be found (as the Lixiscope against TD), the incidence of ascites is expected to be dramatically reduced.</p> <p>Only the susceptibility to hot conditions is directly related to rapid growth, because it is driven by high rate of feed intake and metabolism which results in excessive internal heat production, and it requires different breeding approaches than those that should be used for the other welfare problems (as described by Cahaner, A., S. Druyan, Y. Hadad, L. Yadgari, N. Astrachan, A. Kalinowski, and G. Romo. 2008. Breeding broilers for tolerance to stresses. 8 pages. In: CD Proc. 23rd World Poultry Congress, Brisbane, Australia).</p>	<p>Sentence rephrased ‘Most of the welfare problems of broilers are associated with genetic selection for faster and more efficient production’ (see chapter 3 (EFSA Journal 2010; 8 (7):1666) The text presenting the welfare problems of musculoskeletal disorders, ascites, thermal discomfort and genetic selections were further developed (see chapter 3.2, 3.5, 3.7 and 5 (EFSA Journal 2010; 8 (7):1666)</p>

ORGANISATION	CHAPTER_TEXT	COMMENTS_TEXT	COMMENTS_DEAL
The Hebrew University	Appendix A: Examples on Genotype × Environment interaction	<p>A practical example of G×E (with controlled heat stress as E), yet very similar to the basic textbook example in lines 2522-2528, has been described in: Deeb, N. and A. Cahaner, 2002. Genotype-by-environment interaction with broiler genotypes differing in growth rate. 3. Growth rate and water consumption of broiler progeny from weight-selected versus non-selected parents under normal and high ambient temperatures. Poultry Sci. 81:293-301.</p> <p>Similarly, a practical example of G×E (with natural heat stress as E) very similar to the textbook example in lines 2547-2553, has been described in: Settar, P., S. Yalçin, L. Türkmüt, S. Ozkan, and A. Cahaner, 1999. Season by genotype interaction related to broiler growth rate and heat tolerance. Poultry Sci. 78:1353-1358.</p>	The information was taken into account and quotation inserted (see appendix B, EFSA Journal 2010; 8 (7):1666)
The Hebrew University	7.6. Policies of breeding companies regarding selection for welfare versus production	<p>Table 2: I assume that the text and the table refer to change in body weight (BW) at a certain target age (42 days?) hence the units are grams (g) and not g/day. Lines 1948-9: 40-80 g are indeed the average genetic gain (per selection cycle) in BW at a marketing age. However, these values are NOT shown in the last column of Table 2, and they should be backed by proper references.</p>	Description of table and reference in text were corrected (see chapter 5.6, EFSA Journal 2010; 8 (7):1666)
The Hebrew University	6.7. Thermal discomfort	<p>Lines 1583-90: The papers by Al-Murrani et al. are not in the list of References. However, I suggest to remove this paragraph altogether, because these studies were NOT conducted with broilers, but with egg-type chickens. In the stock they used, due to its low growth rate and body weight (about 700 to 900g at 8 weeks of age, Table 5 in Al-Murrani et al., 2006), excessive internal heat production is NOT the cause of discomfort under heat stress.</p>	The reference was listed. And clarification to the text added 'Al-Murrani et al. (1997) examined Heterophil/Lymphocyte ratio (H/L) as criterion for selection for resistance to heat stress in laying hens.' (See chapter 3.7 and references EFSA Journal 2010; 8 (7):1666)
The Hebrew University	6.7. Thermal discomfort	<p>Lines 1542-3: From the 2 ways to reduce hyperthermia, decreasing heat production is easily achieved by lowering feed intake (genetically or by management), but it also lowers production efficiency hence increases meat price. The other way – increasing heat dissipation – allows to maintain maximal growth efficiency, but doing it by management (cooling systems) is very costly. The genetic option of increasing heat dissipation by genes that reduce feather coverage must be mentioned in the context of broiler breeding.</p>	The information was taken into account, text modified and proposed author quoted. 'It has been shown that broilers with reduced feather coverage inheriting the

ORGANISATION	CHAPTER_TEXT	COMMENTS_TEXT	COMMENTS_DEAL
		<p>This option, as well as the whole issue of association between growth rate in susceptibility to heat, are thoroughly reviewed in the following chapter, which should be a key reference in the section on Thermal discomfort.</p> <p>Cahaner, A. 2008. Breeding Fast-growing, high-yield Broilers for Hot Conditions. Pages 30-47 in Poultry Production in Hot Climates (2nd ed.) N. J. Dagher, ed. CAB International, Oxfordshire, UK.</p>	<p>(naked-neck gene) reared at 35 C compared to 25 C are able to minimize their elevation of body temperature compared with their fully feathered counterparts (commercial broilers) but tolerance to heat stress was limited (Cahaner et al, 2008).’ (see chapter 3.7, EFSA Journal 2010; 8 (7):1666)</p>
The Hebrew University	6.5. Ascites, pericarditis, sudden death syndrome and spiking mortality syndrome	<p>Line 1466: is should be "increasing ambient temperature...". See below avery recent reference to this aspects.</p> <p>Lines 1470 to 1490 in the list of References: "Druan" is wrong. It should be "Druyan" in all cases.</p> <p>Line 1472: "Druyan et al. 20005" is wrong.</p> <p>Line 1475: Druyan and Cahaner 2007 not in the list of References.</p> <p>Line 1945: Deeb et al., 2002 not in the list of References.</p> <p>Ozkan, S., C. Takma, S. Yahav, B. Sogut, L. Turkmüt, H. Erturun, and A. Cahaner. 2010. The effects of feed restriction and ambient temperature on growth and ascites mortality of broilers reared at high altitude. Poult. Sci. 89:974-985.</p>	<p>The information was taken into account, editorial changes, corrections of the citations and list of references done (see chapter 3.5, EFSA Journal 2010; 8 (7):1666)</p>
The Hebrew University	6.4. Contact dermatitis	<p>Lines 1428-9: I assume that in the term "breast burns" you refer to breast blisters. With this regard, it worth mentioning that the incidence of breast blisters has been dramatically reduced due to the selection for higher breast meat yield. The change in breast shape reduced/eliminated the direct pressure on the keel bone when the broilers rest on the litter. This is a nice example of improved welfare following selection for improved production.</p>	<p>‘Subsequently keel bone conformation was added as a selection criterion to decrease the prevalence of breast blisters’(see chapter 5.1, EFSA Journal 2010; 8 (7):1666)</p>

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Senior poultry journalist	2. Scope and objectives	<p>What about broilers breeders which are selected in United States (Cobb, Arbor Acres, Peterson...) or in Asia, and sold in Europe ?</p> <p>How EU can impose its welfare considerations to foreign companies which are competitors not only in Europe with european companies (Aviagen/Ross, Hubbard/Grimaud...) but also all over the world?</p> <p>If european breeders have to comply with strong welfare regulations, it will be imposible for them to compete inside Europe and outside with americans companies.</p> <p>These kind of regulations will accelerate decrease of broiler european production and increase of chicken meat imported from Brazil, Thailand...Only in France, more than 40 % of "standard" chicken meat (without label rouge-slow growth rate strain chickens) are actually imported from third countries, directly or via Netherlands, Germany...</p> <p>Gerard Le Boucher, former editor of french poultry magazine "Filières Avicoles".</p>	These issues are outside the mandate's scope.

## ABBREVIATIONS

AFSSA	Agence Française de Sécurité Sanitaire des Aliments
AGP	Antimicrobial Growth Promoter
AHAW	Animal Health and Welfare Unit
CiWF	Compassion in World Farming
DATEX	Data Collection and Exposure Unit
DEFRA	Department for Environment, Food and Rural Affairs
EADGENE	European Animal Disease Genomics Network of Excellence for Animal Health and Food Safety
EFABAR	EFABAR is a Code of Good Practice for Farm Animal Breeding and Reproduction organizations
EFFAB	European Forum of Farm Animal Breeders
EFSA	European Food Safety Agency
EPB	European Poultry Breeders
EU	European Union
FABRE	Farm Animal Breeding and Reproduction Technology Platform
FAWC	Farm Animal Welfare Council
ITAVI	Institut Technique de l'Aviculture
RSPCA	Royal Society for the Prevention of Cruelty to Animals
TOGA	Toward an information system on broiler chicken welfare: Genetic selection Aspects