

DELIVERABLE

D.4.1.1 REVIEW OF EXISTING COURSES AND MATERIALS FOR POULTRY

Contents

1. Introduction

2. Methodology used

3. Assessment of the training material

3.1. Broilers welfare on farm

3.2. Laying hens welfare in alternative housing systems

3.3. State of consciousness after waterbath stunning of broilers and turkeys

4. Conclusions

5. References

1. Introduction

The aim of sub-activity 4.1 was to evaluate the existing training courses for poultry welfare assessment. It consisted on a description of existing courses and materials including information on objectives, content and training materials as well as an identification of the gaps that the Centre could possibly address in the future. Specifically, EURCAW-Poultry-SFA wanted:

- to review and assess the existing training courses and materials in use at Better Training for Safer Food (BTSF), Member State or other levels (*e.g.*, national and regional training courses)

This deliverable contains an approach of what is taught in both BTSF and EU National training for the three priority areas of EURCAW-Poultry-SFA:

- **Priority area 1.** Broilers welfare on farm (Council Directive 2007/43/EC of 28 June 2007 laying down minimum rules for the protection of chickens kept for meat production).
- **Priority area 2.** Laying hens welfare in alternative housing systems (Council Directive 1999/74/EC of 19 July 1999 laying down minimum standards for the protection of laying hens).
- **Priority area 3.** State of consciousness after waterbath stunning of broilers and turkeys (Council Regulation (EC) No 1099/2009 of 24 September 2009 on the protection of animals at the time of killing).

BTSF (https://ec.europa.eu/chafea/food/index_en.htm) is an initiative of the European Commission aimed at organising and developing an EU training strategy in several areas including the animal welfare. Training is designed for staff of Competent Authorities of EU Member States involved in official control activities towards keeping them updated with all aspects of Community law to ensure that controls are carried out in a more uniform, objective and conveniently in all Member States. The training is conducted in English.

Within the BTSF Programme, training and education are key parameters and the expected outcomes are:

- To promote an integrated and global approach to the legislation.

- To increase competence and expertise of controlling authorities, imposing high standards on control officials in the Member States.
- To encourage a harmonized approach to EU and national control systems.
- To spread knowledge and awareness of EU law in the specific fields.

Besides BTSF, National training is also carried out. While BTSF is the training for the EU Member States trainers, the National training is intended for the official veterinarians of the related Member State. In this sense, it might imply slight differences from the EU legislation in animal welfare corresponding to the transcription of directives into national laws, with a specific way of implementation. Moreover, National trainings are conducted in the official languages of the Member States.

Thus, EURCAW-Poultry-SFA requested both BTSF and the National training materials of three out of four EU Member States that belong to its Consortium (*i.e.*, France, Spain and Italy). All were reviewed from a perspective of coverage of the animal (ABI), resource (RBI), and management-based indicators (MBI) listed in deliverables (D2.1.1, D2.1.2, D2.1.3) related to sub-activity 2.1.

2. Methodology used

BTSF syllabus and training material from 2011 to 2019 related to the three priority areas were obtained and reviewed. BTSF courses include not only the theoretical lectures but also practical cases and general discussion. However, this deliverable only considers the theoretical lectures. A summary of the BTSF courses reviewed specifying the year, the number of editions, and the countries where the training took place, is shown in Table 1. For additional information of BTSF content per editions see Annex I. It should be highlighted that the main goal of the BTSF courses have remained along the past editions, but their content has been slightly modified according to the scientific updates and due to different lecturers.

Table 1. General information about the Better Training for Safer Food (BTSF) courses editions revised related to broiler and laying hens welfare on-farm and waterbath stunning in poultry.

Title/topic	Year	Num. of editions	Country
Animal welfare in poultry production (laying hens and chickens kept for meat production)	2011-2012	2	Italy
	2013-2014	4	Italy (2) and UK (2)
Animal welfare in broiler production	2015-2016	2	Italy
Animal welfare in laying hen production	2015-2016	2	UK
Animal welfare in poultry production (chickens kept for meat production)	2018-2019	3	Sweden (1)
			The Netherlands (2)
Animal welfare at poultry slaughter	2011	1	Spain
	2013-2014	2	Spain and Italy
	2016	1	Spain
Animal welfare at poultry slaughter (advanced level)	2018	1	Germany
Animal welfare at slaughter and in killing for disease control	2012	1	Spain
	2014	2	Spain and Italy
	2015	1	Italy

Furthermore, several National training course materials related to broiler and laying hens welfare on-farm (*i.e.*, Spain) and the assessment of the state of consciousness after waterbath stunning were also revised (*i.e.*, France and Italy). A summary of these reviewed courses specifying the EU member state, the year and the

general content of the training is shown in Table 2. For additional information of National training content per editions see Annex II.

Table 2. General information about the National training courses revised related to broiler and laying hens welfare on-farm and the assessment of the state of consciousness after waterbath stunning in poultry.

Title/topic	Year	Num. of editions	Location
Poultry Welfare	2014	1	Spain
Protection of farmed animals. Poultry meat production	2015	1	Spain
Training course for veterinarian evaluators and trainers (II.ZZ.SS. network): risk assessment applied to well-being and biosecurity through the use of the Classyfarm checklists. Specific module for poultry farming	2019	1	Italy
Animal protection in slaughterhouses for poultry and rabbits and associated official controls	2020	1	France

Once the training material was received, both BTSF and national training material were reviewed in order to score at which extend the indicators for the assessment of the requirements of the legislation were covered in the lectures. The welfare indicators were retrieved from those identified in the deliverable 2.1.1. However, while all the ABIs were included, only those RBIs and MBIs that need for training were considered. For this purpose, each indicator was scored according to the coverage level found in the training material as follows:

- 0** = indicator considered to be “not covered” as there is no evidence to be mentioned in any lecture of the training material reviewed.
- 1** = indicator considered to be “partially covered” as it was mentioned in training material but without evidence of detailed description of the methodology (*i.e.*, found in text).
- 2** = indicator considered to be “well covered” as it was mentioned in the training material and with evidence of detailed description of the methodology and assessment (*i.e.*, found in text along with audio-visual support such as photography or videos, or case studies).

3. Assessment of the training material

3.1. Broilers welfare on farm

The lectures from BTSF and national training courses were analyzed and the coverage of the welfare indicators were scored. The results are presented in Table 3 (split in 3.1, 3.2 and 3.3).

Some of the revised lectures from BTSF or at national level showed the list of the legal requirements but apparently, without a detailed explanation of the requirement or the indicators that could be used to assess the compliance of the requirement. These lectures are helpful to have a general overview of the legal requirements, but more details are needed in the lectures in order to know which indicators can be used when assessing the compliance of each requirement and the related methodology.

BTSF lectures addressed some general topics along all the editions (*i.e.*, stocking density in relation to animal welfare) but also some lectures also highlight a topic of interest in some of the editions. For example:

- “How to calculate stocking density” was presented in BTSF 2015 -2016 edition.
- “Welfare problems caused by genetic factors and the resistance to stress of commercial broilers” was presented during BTSF 2015 -16 and 2018-19, but not in 2011-2014 editions because then the training courses included laying hens and a more general lecture about “Physiology and stress indicators in poultry” was included.
- “Transect walks” was addressed during BTSF 2015-2016 edition.

During the BTSF trainings, experiences from other countries were presented. These countries were Denmark, Sweden, Netherlands and Italy. Examples from Denmark and Sweden were also presented in national training courses, (*i.e.*, Spain in 2014).

Table 3.1. Coverage scores of the selected Animal (ABI) and Resource-based Indicators (RBI) for the assessment of welfare of broilers on farm and at slaughterhouse (SH) from the revised Better Training for Safer Food (BTSF) and National training material (Spain).

Indicator	Type of indicator	Farm/SH	Training material, year	Coverage score
Severe lameness / gait score	ABI	Farm	BTSF (18-19; 15-16; 13-14; 11-12)	2
			Spain, 2015	0
			Spain, 2014	0
Mortality	ABI	Farm	BTSF (18-19; 15-16; 13-14; 11-12)	2
			Spain, 2015	2
			Spain, 2014	2
Feather integrity	ABI	Farm	BTSF (18-19; 15-16; 13-14; 11-12)	1
			Spain, 2015	1
			Spain, 2014	0
Feather cleanliness	ABI	Farm/SH	BTSF (18-19; 15-16; 13-14; 11-12)	2
			Spain, 2015	2
			Spain, 2014	2
Faeces appearance	ABI	Farm	BTSF (18-19)	1
			BTSF (15-16; 13-14; 11-12)	0
			Spain, 2015	0
			Spain, 2014	0
Emaciated animals	ABI	Farm/SH	BTSF (18-19; 15-16; 13-14)	2
			BTSF (11-12)	0
			Spain, 2015	0
			Spain, 2014	0
Animals’ drinking posture	ABI	Farm	BTSF (18-19; 15-16; 13-14; 11-12)	0
			Spain, 2015	1
			Spain, 2014	2
Litter quality	RBI	Farm	BTSF (18-19; 15-16; 13-14)	2
			BTSF (11-12)	1
			Spain, 2015	2
			Spain, 2014	2
Dust bathing behaviour	ABI	Farm	BTSF (18-19; 13-14)	1
			BTSF (15-16; 11-12)	0
			Spain, 2015	0
			Spain, 2014	0
Foot pad dermatitis	ABI	Farm/SH	BTSF (18-19; 15-16; 13-14; 11-12)	2

			Spain, 2015	2
			Spain, 2014	2
Hock burns	ABI	Farm/SH	BTSF (18-19; 15-16; 13-14; 11-12)	2
			Spain, 2015	2
			Spain, 2014	2

Table 3.2. Coverage scores of the selected Animal (ABI) and Resource-based Indicators (RBI) for the assessment of welfare of broilers on farm and at slaughterhouse (SH) from the revised Better Training for Safer Food (BTSF) and National training material (Spain).

Indicator	Type of indicator	Farm/SH	Training material, year	Coverage score
Stocking density	RBI	Farm	BTSF (18-19; 15-16; 13-14; 11-12)	2
			Spain, 2015	1
			Spain, 2014	2
Back scratches due to crowding around the feeders	ABI	Farm/SH	BTSF (18-19; 15-16; 11-12)	0
			BTSF (13-14)	1
			Spain, 2015	0
			Spain, 2014	1
Competition between animals trying to reach the drinker	ABI	Farm	BTSF (18-19; 15-16; 13-14; 11-12)	0
			Spain, 2015	0
			Spain, 2014	0
Panting	ABI	Farm/SH	BTSF (18-19; 15-16; 13-14)	2
			BTSF (11-12)	1
			Spain, 2015	1
			Spain, 2014	0
Huddling	ABI	Farm/SH	BTSF (18-19; 13-14)	0
			BTSF (15-16; 11-12)	1
			Spain, 2015	1
			Spain, 2014	0
Shivering	ABI	Farm/SH	BTSF (18-19; 15-16; 13-14; 11-12)	0
			Spain, 2015	0
			Spain, 2014	0
				0
Changes in the spatial distribution of bird	ABI	Farm	BTSF (18-19; 13-14)	1
			BTSF (15-16; 11-12)	0
			Spain, 2015	2
			Spain, 2014	0
Breast blisters	ABI	SH	BTSF (18-19; 15-16; 13-14)	2
			BTSF (11-12)	1
			Spain, 2015	2
			Spain, 2014	2
Temperature and humidity measurements	RBI	Farm	BTSF (18-19; 13-14)	0
			BTSF (15-16; 11-12)	1
			Spain, 2015	0
			Spain, 2014	2
Design and functioning of ventilation, heating and cooling systems	RBI	Farm	BTSF (18-19; 15-16; 11-12)	1
			BTSF (13-14)	0
			Spain, 2015	1
			Spain, 2014	2
Gas measurements (ammonia and carbon dioxide)	RBI	Farm	BTSF (18-19; 13-14)	0
			BTSF (15-16; 11-12)	1
			Spain, 2015	0
			Spain, 2014	2
Ocular abnormalities	ABI	SH	BTSF (18-19; 15-16; 13-14; 11-12)	1
			Spain, 2015	0
			Spain, 2014	1

Table 3.3. Coverage scores of the selected Animal (ABI) and Resource-based Indicators (RBI) for the assessment of welfare of broilers on farm and at slaughterhouse (SH) from the revised Better Training for Safer Food (BTSF) and National training material (Spain).

Indicator	Type of indicator	Farm/SH	Training material, year	Coverage score
Dust sheet test	RBI	Farm	BTSF (18-19; 13-14)	0
			BTSF (15-16; 11-12)	1
			Spain, 2015	1
			Spain, 2014	0
Light intensity measurements	RBI	Farm	BTSF (18-19; 15-16; 13-14; 11-12)	2
			Spain, 2015	0
			Spain, 2014	2
Beak trimming quality	ABI	Farm	BTSF (18-19; 15-16; 13-14; 11-12)	0
			Spain, 2015	0
			Spain, 2014	0
Dead on arrival	ABI	SH	BTSF (18-19; 15-16; 13-14)	2
			BTSF (11-12)	1
			Spain, 2015	2
			Spain, 2014	1
Ascites	ABI	SH	BTSF (18-19; 15-16)	1
			BTSF (13-14)	2
			BTSF (11-12)	0
			Spain, 2015	1
			Spain, 2014	1
Cellulitis	ABI	SH	BTSF (18-19; 15-16; 11-12)	0
			BSTF (13-14)	2
			Spain, 2015	0
			Spain, 2014	2
Joint lesions	ABI	SH	BTSF (18-19; 15-16; 11-12)	0
			BSTF (13-14)	2
			Spain, 2015	0
			Spain, 2014	0
Scratches	ABI	SH	BTSF (18-19; 15-16; 11-12)	0
			BTSF (13-14)	1
			Spain, 2015	0
			Spain, 2014	2
Wing fractures	ABI	SH	BTSF (18-19; 15-16; 13-14)	2
			BTSF (11-12)	1
			Spain, 2015	2
			Spain, 2014	0

Gaps that the centre could possibly address in the future:

In general, ABIs from Welfare Quality® (2009) are well described in the training courses (*i.e.*, footpad dermatitis, hock burns, wing fractures, breast blisters, feather cleanliness, litter quality, panting and lameness). The indicators assessed at the slaughterhouse during *post-mortem* inspections (*i.e.*, foot pad dermatitis, hock lesions, dead on arrival, wing fractures, breast blisters) are usually well covered. Some other indicators assessed at slaughterhouse (*i.e.*, cellulitis, scratches, joint lesions and ascites) are well covered only

in some courses, and perhaps need more detailed description of the methodology and assessment in the future.

Some RBIs are described in detail in some training courses (*i.e.*, stocking density, temperature and humidity, gas measurements, light intensity measurements). However, at glance there is not enough evidence to affirm that the methodology for their assessment is fully covered.

Indicators identified in deliverable 2.1.1. that are not described in any training course:

- Competition between animals trying to reach the drinker
- Shivering
- Sound level
- Beak trimming quality (in broilers)

Indicators identified in deliverable 2.1.1. and mentioned in some training courses but without evidence of detailed description:

- Feather integrity
- Faeces appearance
- Dust bathing behaviour
- Back scratches due to crowding around the feeders
- Huddling
- Ocular abnormalities
- Dust sheet test

Indicators that are addressed in more detail in the Spanish courses than in the BTSF courses, for example:

- Animals' drinking posture
- Changes in the spatial distribution of birds
- Temperature and humidity
- Design and functioning of ventilation, heating and cooling systems
- Gas measurements (ammonia and carbon dioxide)
- Scratches

3.2. Laying hens on farm

Lectures available from BTSF and national training courses were analyzed. The results are presented in Table 4 (split in 4.1 and 4.2).

As for broilers, the lectures are helpful to have a general overview of the application of the Directive in Member States. Experiences from other Member States were also presented, as for broilers. However, more details are needed in order to understand which indicators can be used per each requirement and perform a good official control. Only one BTSF lecture given in 2016 described the way to score the plumage condition, the skin condition (wounds) the keel bone condition and feet conditions, which is of interest. Some lectures give details of RBIs, but these are on furnished cages, which is no more update.

The national training from Spain mentions some of the indicators but not all of them. Although RBIs (*i.e.*, stocking density, nest space, feeder and drinker space, etc.) are described in detail, so are not the ABIs.

Table 4.1. Coverage scores of the selected Animal (ABI) and Resource-based Indicators (RBI) for the assessment of welfare of laying hens on farm and at slaughterhouse (SH) from the revised Better Training for Safer Food (BTSF) and National training material (Spain).

Indicator	Type of indicator	Farm/SH	Training material, year	Coverage score
Avoidance distance test, novel object test	ABI	Farm	BTSF (13-14; 15-16)	2
			BTSF (11-12)	0
			Spain, 2014	0
Comb condition, skin condition (wound), body condition	ABI	Farm	BTSF (13-14; 15-16)	2
			BTSF (11-12)	0
			Spain, 2014	0
Density	RBI	Farm	BTSF (13-14; 15-16)	1
			BTSF (11-12)	0
			Spain, 2014	2
Number or length of feeder and drinker	RBI	Farm	BTSF (15-16; 13-14; 11-12)	0
			Spain, 2014	2
Lesions (mucus membranes, air sac, keratoconjunctivitis, lung)	ABI	SH	BTSF (15-16; 13-14; 11-12)	0
			Spain, 2014	0
Food intake and weight loss	ABI	Farm	BTSF (15-16; 13-14; 11-12)	0
			Spain, 2014	0
Gas measurements (ammonia and carbon dioxide)	RBI	Farm	BTSF (15-16; 13-14; 11-12)	0
			Spain, 2014	1
Dust level	RBI	Farm	BTSF (15-16; 13-14; 11-12)	0
			Spain, 2014	1
Animal's activity and aggressive behaviour	ABI	Farm	BTSF (15-16; 13-14; 11-12)	0
			Spain, 2014	0
Feather integrity	ABI	Farm	BTSF (13-14; 15-16)	2
			BTSF (11-12)	0
			Spain, 2014	1
Light intensity measurements	RBI	Farm	BTSF (15-16; 13-14; 11-12)	0
			Spain, 2014	0
Keel bone damage	ABI	SH	BTSF (14-15)	2
			BTSF (13-14; 15-16)	0
			Spain, 2014	0
Proportion of hens on perches at dark period	ABI	Farm	BTSF (15-16; 13-14; 11-12)	0
			Spain, 2014	0
Light evenness	RBI	Farm	BTSF (15-16; 13-14; 11-12)	0
			Spain, 2014	0
Panting, huddling, shivering	ABI	Farm/ SH	BTSF (15-16; 13-14; 11-12)	0
			Spain, 2014	0
Temperature and humidity measurements	RBI	Farm	BTSF (15-16; 13-14; 11-12)	0
			Spain, 2014	0
Design and functioning of ventilation, heating and cooling systems	RBI	Farm	BTSF (15-16; 13-14; 11-12)	0
			Spain, 2014	0
Birds per m ² of nest space	RBI	Farm	BTSF (15-16; 13-14; 11-12)	0
			Spain, 2014	2
Number of hens perched (day/night)	ABI	Farm	BTSF (15-16; 13-14; 11-12)	0
			Spain, 2014	0
Perches disposition and quantity	RBI	Farm	BTSF (15-16; 13-14; 11-12)	0
			Spain, 2014	2

Table 4.2. Coverage scores of the selected Animal (ABI) and Resource-based Indicators (RBI) for the assessment of welfare of laying hens on farm and at slaughterhouse (SH) from the revised Better Training for Safer Food (BTSF) and National training material (Spain).

Indicator	Type of indicator	Farm/SH	Training material, year	Coverage score
Foot pad dermatitis and foot lesions	ABI	Farm/ SH	BTSF (13-14; 15-16)	2
			BTSF (11-12)	0
			Spain, 2014	1
Surface of littered area per hen (in cm ²)	RBI	Farm	BTSF (15-16; 13-14; 11-12)	0
			Spain, 2014	1
Numbers of claws supported by the floor	ABI	Farm	BTSF (15-16; 13-14; 11-12)	0
			Spain, 2014	0
Size of open space between slats	RBI	Farm	BTSF (15-16; 13-14; 11-12)	0
			Spain, 2014	0
Description and measurements of the levels and furniture	RBI	Farm	BTSF (15-16)	1
			BTSF (13-14; 11-12)	0
			Spain, 2014	0
Presence of hens on the open-air runs during inspection	ABI	Farm	BTSF (15-16; 13-14; 11-12)	0
			Spain, 2014	1
Use of free range	ABI	Farm	BTSF (15-16; 13-14; 11-12)	0
			Spain, 2014	1
Number and accessibility of popholes	RBI	Farm	BTSF (15-16; 13-14; 11-12)	0
			Spain, 2014	0
Birds per hectare of ground	RBI	Farm	BTSF (15-16; 13-14; 11-12)	0
			Spain, 2014	0
Disposition of open run (length, shelters, trees, ...)	RBI	Farm	BTSF (15-16; 13-14; 11-12)	0
			Spain, 2014	1

Gaps that the centre could possibly address in the future

As for broilers, ABIs from Welfare Quality[®] (2009) are well described in the BTSF training courses. Some indicators are covered (the plumage condition, the skin condition including wounds, the keel bone condition and feet conditions), while others not such as the numbers of claws supported by the floor, presence of hens on the open-air runs during inspection or use of free-range posture are not described in detail (methodology and assessment description). Some RBIs, i.e. surface of littered area per hen, size of open space between slats, number and accessibility of popholes, birds per hectare of ground or disposition of open run (length, shelters, trees, etc.) should be explained. However, there is not enough information to know if the methodology for their assessment is fully covered.

3.3 State of consciousness after waterbath stunning of broilers and turkeys

The lectures available from the training courses were revised and the information contained where classified according to the level of coverage of the most relevant indicators of welfare related to the state of consciousness after waterbath stunning. The results are presented in Table 5 (split in 5.1, 5.2, 5.3).

Pre-stun shocks assessment and delayed induction of unconsciousness using ABIs have not been covered either in BTSF in any of their past course editions or any national training courses. On the contrary, pre-stun shocks assessment using RBIs has been covered only in BTSF, especially in the 2013 edition. The assessment of delayed induction of unconsciousness using RBIs have been partially or totally covered in BTSF and national training courses (Table 5.1.).

Table 5.1. Coverage scores of the selected Animal (ABI), Resource (RBI) and Management-based Indicators (MBI) for the assessment of the state of consciousness after waterbath stunning in broilers and turkeys from the revised Better Training for Safer Food (BTSF) and National training material (France and Italy).

Welfare issue	Indicator	Type of indicator	Training material, year	Coverage score		
Pre-stun shocks	Vigorous wing flapping	ABI	BTSF, 2011 to 2018	0		
			France, 2020	0		
			Italy, 2018	0		
	Withdrawal reactions of wings or head	ABI	BTSF, 2011 to 2018	0		
			France, 2020	0		
			Italy, 2018	0		
	Vocalisations	ABI	BTSF, 2011 to 2018	0		
			France, 2020	0		
			Italy, 2018	0		
			Design, construction and maintenance of the shackle line	RBI	BTSF, 2011 to 2018	1
					France, 2020	0
					Italy, 2018	0
Design, construction and maintenance of the ramp	RBI	BTSF, 2011 to 2018	1			
		France, 2020	0			
		Italy, 2018	0			
Delayed induction of unconsciousness	Time interval between head immersion and tonic seizure	ABI	BTSF, 2011 to 2018	0		
			France, 2020	0		
			Italy, 2018	0		
	Presence of wing flapping while the head is immersed in the waterbath and before tonic seizure occurs	ABI	BTSF, 2011 to 2018	0		
			France, 2020	0		
			Italy, 2018	0		
	Frequency, minimum average current (mA/bird) and duration of exposure	RBI	BTSF, 2011 to 2018	2		
			France, 2020	2		
			Italy, 2018	2		
Records of frequency of calibration and maintenance of the equipment	MBI	BTSF, 2011 to 2018	2			
		France, 2020	1			
			Italy, 2018	0		

Regarding the assessment of both failure in inducing unconsciousness and recovery of consciousness before death, BTSF material fully covered the ABIs since the 2013-2014 edition. At national level ABIs are also well described in lectures (Table 5.2.). However, for an effective stunning one of the key factors is the immersion of the birds up to the base of the wings and sometimes training on the assessment of the level of immersion related indicators are missing in most of the BTSF material but not in the national ones.

Table 5.2. Coverage scores of the selected Animal (ABI), Resource (RBI) and Management-based Indicators (MBI) for the assessment of the state of consciousness after waterbath stunning in broilers and turkeys from the revised Better Training for Safer Food (BTSF) and National training material (France and Italy).

Welfare issue	Indicator	Type of indicator	Training material, year	Coverage score
Failure in inducing unconsciousness	Tonic seizures	ABI	BTSF, 2014 to 2018	2
			France, 2020	2
			Italy, 2018	2
	Breathing	ABI	BTSF, 2014 to 2018	2
			France, 2020	2
			Italy, 2018	2
	Spontaneous blinking	ABI	BTSF, 2014 to 2018	2
			France, 2020	2
			Italy, 2018	2
	Corneal or palpebral reflex	ABI	BTSF, 2014 to 2018	2
			France, 2020	2
			Italy, 2018	2
Vocalisation	ABI	BTSF, 2014 to 2018	2	
		France, 2020	2	
		Italy, 2018	2	
Frequency, minimum average current (mA/bird) and duration of exposure	RBI	BTSF, 2011 to 2018	2	
		France, 2020	2	
		Italy, 2018	2	
Recovery of consciousness before death	Wing flapping	ABI	BTSF, 2014 to 2018	2
			France, 2020	2
			Italy, 2018	2
	Breathing	ABI	BTSF, 2014 to 2018	2
			France, 2020	2
			Italy, 2018	2
Corneal or palpebral reflex	ABI	BTSF, 2014 to 2018	2	
		France, 2020	2	
		Italy, 2018	2	
Spontaneous swallowing	ABI	BTSF, 2014 to 2018	2	
		France, 2020	2	
		Italy, 2018	2	
Head shacking	ABI	BTSF, 2014 to 2018	2	
		France, 2020	2	
			Italy, 2018	2

Table 5.3. Coverage scores of the selected Animal (ABI), Resource (RBI) and Management-based Indicators (MBI) for the assessment of the state of consciousness after waterbath stunning in broilers and turkeys from the revised Better Training for Safer Food (BTSF) and National training material (France and Italy).

Welfare issue	Indicator	Type of indicator	Training material	Coverage score
The level of immersion of the birds	Bird's level of submersion into the waterbath	ABI	BTSF, 2011 and 2014	1
			BTSF, 2013, 2016 and 2018	0
			France, 2020	2
	Adequate waterbath height and water level	RBI	Italy, 2018	2
			BTSF, 2011 to 2018	1
			France, 2020	1
Electrodes in waterbath	Length of the electrode placed in the water with an extension of the full length of the waterbath.	RBI	Italy, 2018	2
			BTSF, 2011 to 2018	2
			France, 2020	0
	Continuous contact with the earthed rubbing bar.	RBI	Italy, 2018	2
			BTSF, 2011 to 2018	1
			France, 2020	0
Checks	Frequency and distribution of the checks.	MBI	Italy, 2018	0
			BTSF, 2011 to 2018	0
			France, 2020	2
	Representative and sufficient sample of animals	MBI	BTSF, 2014	2
			BTSF, 2011, 2013, 2016 and 2018	0
			France, 2020	2
			Italy, 2018	0

The ABIs shown in Tables 5.1 to 5.3 should be assessed on a representative sample size. The frequency and distribution with which the official veterinarian should do these checks is lacking in most of the training materials. In BTSF, only the 2014 edition included the calculation of the sample size, but it was removed in the following editions. However, France is nowadays covering the description of the sample size and frequency of sampling.

It is worth noting the evolution of BTSF training along the editions since RBIs and MBIs used to be the main indicators for poultry welfare assessment until 2013. Since then, efforts have been made on evaluate the welfare of animals assessing directly the animal and not the resource or the management. Thus, from 2014 on, BTSF put attention for the first time in ABIs for the assessment of the state of consciousness in poultry after waterbath stunning and so it was reflected in the national training material. This update in training content seems to be a consequence of the EFSA report (2013a) which recommends ABIs for the assessment of the state of consciousness. The same occurred about the method for calculation of sample size and the frequency and distribution to check for bird's consciousness. There was a gap on training until EFSA gave guidance and developed a calculation tool (EFSA, 2013b) after this, these information were delivered in BTSF training material in 2014. Following this trend, it is expected that training on ABIs for pre-stun shocks and delayed induction of unconsciousness will be included in both BTSF and national training materials since these risks for poultry welfare were addressed by EFSA in 2019. This change in focus the welfare assessment from primarily RBIs and MBIs to ABIs implies more training for the official veterinarians and efforts to develop standardized methods for welfare assessment.

Gaps that the centre could possibly address in the future

ABIs for the welfare requirements related to the state of consciousness (failure of inducing consciousness and recovery of consciousness before death) are currently fully covered in all training courses. However, ABIs for the assessment of pre-stun shocks or delayed induction of consciousness at the entrance of the waterbath are missing in all the training material reviewed. Thus, it is necessary to put attention especially on these welfare requirements for an even more complete training.

In order to assess the welfare of broilers and turkeys when waterbath stunned, it is essential to assess ABIs in a representative sample of animals any time there is a change in the slaughtering (*e.g.*, specie, size of the animals, etc). However, training on how to calculate the sample size and at which frequency animals should be checked, is usually missing in BTSF courses and, probably, a gap in most of the national trainings. In this sense, this should be taken into consideration and it could be possibly addressed by EURCAW-Poultry-SFA in the future.

On the other hand, the inter-observer repeatability of the ABIs when assessing the poultry welfare at slaughterhouse is also a gap of knowledge. However, repeatability of ABIs for the state of consciousness after waterbath stunning is currently addressed by EURCAW-Poultry-SFA and results will be delivered in 2021.

4. Conclusions

- 1) Training courses on poultry welfare exist on farm or at the slaughterhouse in BTSF and some Members States courses. However, the number of National trainings that EURCAW-Poultry-SFA received for revision was scarce.
- 2) The training courses on broilers and laying hens welfare on farm refer to welfare definition, welfare assessment in general focused mainly in the description of the indicators found in the Welfare Quality® (2009) protocol.
- 3) From the whole list of indicators described in D2.1.1. not all of them are covered in the training material that the Centre assessed. In this sense, for the broiler's welfare assessment on farm, three out of the 25 ABIs listed were not covered in any training material revised. In laying hens, 10 out of the 14 ABIs and for the state of consciousness after waterbath stunning, 5 out of 16 ABIs were not covered in any training material that have been checked.
- 4) It is worthy to note that sometimes, specific indicators for welfare assessment were addressed in certain editions of BTSF that were removed in the following ones probably due to different lecturers per BTSF edition. In this sense, it could be pertinent to catch up some past lectures for future editions. On the other hand, sometimes training from Member States offer a better description of certain indicators that were not addressed in BTSF.
- 5) BTSF training material assessment clearly reflects how the welfare assessment have evolved in the last decade in the UE. In this sense, welfare used to be only evaluated by RBIs and MBIs and along the editions, ABIs were gaining ground.

- 6) There is a lack of description of the method related to most of the indicators in the training material and this would be of interest to official veterinarians.
- 7) The present deliverable gave the opportunity to compare trainings and detect gaps that the EURCAW-Poultry-SFA could possibly address in the future.

5. References

- EFSA (European Food Safety Authority). 2013a. Scientific Opinion on monitoring procedures at slaughterhouses for poultry. *EFSA Journal* 11(12):3521.
- EFSA (European Food Safety Authority). 2013b. Sample size calculation tool for monitoring stunning at slaughter. *EFSA supporting publication* EN-541. 18 pp.
- EFSA (European Food Safety Authority). 2019. Poultry welfare at slaughter: hazards identified, measures proposed. *EFSA Journal* 17(11):5849.
- Welfare Quality®. 2009. Welfare Quality® assessment protocol for poultry (broilers, laying hens, Welfare Quality® Consortium, Lelystad, The Netherlands.

ANNEX 1 Better Training for Safer Food training material

Better Training for Safer Food training material

Here, the titles of the lectures per Better Training for Safer Food (BTSF) edition revised and splitted per priority areas are provided below.

1. Welfare of Broilers on farm

2018-2019

- Welfare problems in broilers caused by genetic factors and resistance to stress of commercial broilers
- Common husbandry systems in Europe and their specific and a-specific management procedures
- Broiler chickens: the risk factors affecting animal welfare on farm (density, litter management, microclimate, de-population)
- Animal Based Indicators for on-farm evaluation of broiler welfare and for ante-mortem inspection
- Data collection system of welfare indicators in EU broilers' slaughterhouse
- How NGOs work for better broiler welfare

2015-2016

- Experiences and perspectives on the state of implementation in Europe
- OIE initiatives and standards: animal welfare and broiler chicken production systems
- Welfare problems in broilers caused by genetic factors and resistance to stress of commercial broilers
- Common husbandry systems in Europe and their specific and a-specific management procedures
- The risk factors affecting animal welfare on farm
- Animal Based Measures (ABM) for on-farm evaluation of broiler welfare and for ante-mortem inspection
- Practical examples on the use of ABM and plenary discussion
- Data collection system of welfare indicators in EU broilers' slaughterhouse

2013-2014

- The European legislation on the protection of broiler chickens
- Risk factors affecting the welfare of broiler chickens on farm
- Welfare assessment protocols on farm
- Data collection at slaughterhouse
- Farmers, industry, retailers, and NGOs perspectives

2011-2012

- Broiler chickens: the risk factors affecting animal welfare on farm (density, litter management, microclimate, depopulation)
- Experiences and perspectives on the state of implementation of the broilers Directives by Member States' Competent Authorities
- Broiler chickens: welfare assessment protocols on farm
- Data collection at slaughterhouse
- Farmers and industry perspectives
- Retailers' perspectives

2. Welfare of laying hens on farm

2015-2016 and 2013-2014

- Legal framework on the welfare of laying hens
- How scientific work on ethological needs of the hens have influenced the legislation
- Experiences and perspectives on the state of implementation of the legislation in Europe
- Welfare of laying hens: definitions
- Housing systems and hens: risk to welfare
- Welfare risks related to management procedures
- Animal Based Measures for on-farm evaluation of laying hens' welfare
- Practical examples on the use of ABM and plenary discussion
- Integrated assessment of laying hens welfare on farm in compliance with EU legislation
- Practical examples on welfare assessment on farm
- Preparation to the in-field exercise: how to conduct an audit (useful tools and good practices)

2011-2012

- Experiences and perspectives on the state of implementation of the legislation by Members States Competent Authorities
- Welfare of laying hens: definition
- Housing systems and hens: risk to welfare
- Hen behaviour and behavioral priorities. Physiology and stress indicators.
- Welfare assessment protocols on farm
- Welfare risks related to management procedures (beak trimming, depopulation)
- Integrated assessment of laying hens welfare on farm in compliance with the EU current legislation
- How to conduct an audit: useful tools and good practices to apply during audits/inspections

3. State of consciousness after waterbath stunning in broilers and turkeys

2018-2019

- Inspection vs audit as defined in Regulation (EC) No 882/2004: focus on the difference when examining animal welfare (Ref. Council Regulation (EC) N.1099/2009)
- Preparing animals for slaughter (correct unloading avoidance of heat stress in the lairage, feeding and watering): examples from SOPs
- Humane handling (principles, behavioural characteristics, stockman skills, equipment, etc.): examples from SOPs

- How to set up a training course for the slaughterhouse staff and how to assess the quality of such training
- Preparing animals for slaughter (correct unloading avoidance of heat stress in the lairage, feeding and watering)
- Humane Handling (principles, behavioural characteristics, stockman skills, equipment etc.)
- Shackling
- Malpractice in immobilization of birds
- Relevant case studies on official controls on Animal Welfare at arrival, unloading, lairage, moving the animals to the stunning area
- Welfare indicators for developing monitoring procedures at slaughterhouses for poultry stunned using electrical waterbaths and gas mixtures (toolbox)
- Welfare indicators for developing monitoring procedures at slaughterhouses for poultry slaughtered without stunning (toolbox)
- Good practices for official veterinarians to conduct an audit on AW at poultry slaughter
- Practical cases on official controls at slaughter (presentation and discussion in plenary session)

2016

- Major outcomes from FVO audit reports on animal welfare at poultry slaughter
- Slaughter of animals: OIE Animal Welfare Standards and perspectives
- Key-actors, their role and interactions: Business Operator, Animal Welfare Officer and Competent Authority
- Animal welfare at slaughter as last ring of the chain: the impact of farming and transport on the welfare conditions of poultry on arrival
- Relevant case studies on: Interaction among Business Operator, Animal Welfare Officer and Competent Authority- the impact of farming and transport on the welfare conditions of poultry on arrival

-

2014

- EU legislation on the protection of animals at the time of killing: Council Regulation (EC) N. 1099/2009
- Relevant issues and critical factors affecting the implementation of the Council Regulation (EC) N.1099/2009
- Slaughter of animals: OIE Animal Welfare Standards and perspective
- Slaughterhouse key-actors: Business Operator, Animal Welfare Officer and Competent Authority (roles and interactions)
- How to ensure Animal Welfare from unloading to slaughter
- How the design of facilities and equipment's influences the pre-stunning management
- Standard Operating Procedures: aims, application and checks
- Electrical stunning method (poultry, fish, cattle, pigs)
- Mechanical stunning methods

- Gas stunning methods
- Religious slaughter without stunning
- Religious slaughter with stunning
- Animal welfare and Ethics: The ethical logic of Council Regulation 1099/2009
- The relevance of education and training of slaughterhouse personnel

2011-2012

- Relevant issues and critical factors affecting the implementation of the Council Regulation (EC) N. 1099/2009 – Focus on standard slaughter
- Relevant issues and critical factors affecting the implementation of the Council Regulation (EC) N. 1099/2009 – Focus on religious slaughter
- OIE International Animal Welfare Standards
- Gas stunning methods
- Electrical stunning method (poultry, fish, cattle, pigs)
- Mechanical stunning methods
- Religious slaughter without stunning
- Religious slaughter with stunning
- Religious slaughter practices: the approach of Muslim and Jewish communities in implementing EU requirements without stunning
- Religious slaughter practices: the approach of a European country in implement in EU requirements
- Public awareness, raising issues and main concerns on religious slaughter in Europe
- Animal welfare and Ethics: The ethical logic of Council Regulation 1099/2009
- The relevance of education and training of slaughterhouse personnel

DELIVERABLE: –4.1.1 REVIEW OF EXISTING COURSES AND MATERIALS FOR POULTRY

ANNEX 2 National training material

National training material

General information about the National training courses revised per priority area.

1. Welfare of Broilers on farm

Country	Spain
Year	2015
Title	<i>Curso sobre protección de los animals de granja. Avicultura de carne.</i> Protection of farmed animals. Poultry meat production.
Duration	2.5 days
Objective	Not specified.
Content	12 lectures where the following topics were included: <ul style="list-style-type: none"> • Animal welfare in broilers (assessment and risks) (2). • Turkey production (1). • Duck production (1). • Quails and partridge production (1). • Post-mortem inspection related to welfare on farm (2). • Transport and killing (including on-farm killing and slaughter) (3). • Others (experience from BTSF, studies) (2). <p>In addition, 2 working groups about data collection and recording.</p>

Country	Italy
Year	2019
Title	<i>Corso di formazione per veterinari valutatori e formatori (rete II.ZZ.SS.): la valutazione del rischio applicata al benessere e alla biosicurezza attraverso l'uti lizzo delle check-list Classyfarm. Modulo specifico per l'allevamento avicolo.</i>
Duration	Not specified.
Objective	Not specified.
Content	1 lecture mostly related to biosecurity.

2. Welfare of broilers and laying hens on farm

Country	Spain
Year	2014
Title	<i>Curso sobre bienestar en avicultura</i> Poultry Welfare
Duration	2.5 days
Objective	Not specified.
Content	<p>14 lectures, regarding these topics:</p> <ul style="list-style-type: none"> • Broiler production (Animal welfare on farm, environmental conditions) (2). • Laying hens production (1). • Alternative rearing systems (broiler and laying hens) (1). • Transport and killing (including on farm killing and slaughter) (7). • Slaughter of fur animals (1). • Biosecurity (1). • Traceability (1). <p>In addition, a video training (DEFRA) with a round table.</p>

3. State of consciousness after waterbath stunning in broilers and turkeys

Country	Italy
Year	2019
Title	<i>Protezione dei volatili alla macellazione.</i> Protection of birds at slaughter
Duration	Not specified.
Objective	Not specified.
Content	1 lecture related to poultry welfare at slaughter.

Country	France
Year	2020
Title	<i>Protection des animaux de boucherie et conditions d'abattage</i> Protection of meat animals during slaughtering
Duration	Unknown
Objective	Unknown
Content	Unknown
Institute	Unknown