



**Guidelines for the assessment of turkey welfare on
farm using relevant welfare indicators to assess
compliance with requirements laid down in Directive
98/58 EC**



Guidelines for the assessment of turkey welfare on farm using relevant welfare indicators to assess compliance with requirements laid down in Directive 98/58 EC

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Introduction

Council Directive 98/58/EC concerns the protection of animals kept for farming purposes. It is the sole available legal basis that covers the protection of turkeys during production, as opposed to layers and broilers, which have specific legislation laying down minimum rules for their protection. Council Directive 98/58/EC does not define minimum measurable requirements per se, but broader ones. For example, it requires that livestock are provided with necessary feed and water, and that they are looked after in the case of sickness, that the construction of buildings is such that it does not harm the animals etc.

The European Convention for the Protection of Animals kept for Farming Purposes adopted on 21 June 2001 (COE Recommendations), includes a series of recommendations concerning welfare requirements during turkey production. These recommendations provide a greater level of detail for several requirements which are more generically described in the Council Directive 98/58/EC, and for certain aspects it defines minimum measurable requirements (e.g., illumination level of 10 lux, minimum of two daily inspections by keeper). These requirements per se are not binding (soft legislation) although they have been used in several Member States as a guidance for National legislation on the protection of turkeys on farm, where greater level of detail is needed for certain requirements. Some requirements of the recommendation have therefore been transposed via national legislation or other less binding alternative arrangements (e.g., guidance) in several member states.

The aim of this deliverable is to provide to official inspectors and CAs a guideline that could be used for assessing turkey welfare on farm in compliance with the requirements laid down in Directive 98/58/EC.

Only requirements for which the Directive does not provide the inspectors with sufficient elements, such as minimum light requirements for example, have been integrated with the minimum requirements of the Recommendation of the Council of Europe 2001, as these have been taken as guidance in several EU member states. But these figures are just provided as example that might support the inspector when inspecting the welfare of the turkeys.

In the Italian Classyfarm system for instance, the guidelines developed for the assessment of turkey welfare include minimum requirements from the Council of Europe (CoE) recommendations but underline that in this case the indications provided do not represent compulsory legal requirements but an aid to the inspector when evaluating all the risk factors on farm. Thus, they do not describe explicit legal obligations on the side of the farmer.

Furthermore, for the assessment of some of the requirements of Directive 98/58 we have also inserted as examples some indications taken from the Italian Classyfarm system.

For example, the Classyfarm guidance defines maximum number of animals under the care of a single keeper, minimum experience requirements for turkey keepers and professional training and qualifications, suggests maximum stocking densities (e.g., 60 kg/m² for males and 56 kg/m² for females), maximum ammonia and carbon dioxide levels of 20 ppm 3000 ppm respectively.

The guidance proposed has the objective to provide some figures as example of how inspectors can assess the welfare of turkeys on farm in relation to Directive 98/58, providing also suggestions for identifying best practices, when the assessment of turkey welfare includes requirements beyond minimum legislative requirements, based on COE Recommendations or other indications from Classyfarm which do not describe explicit legal obligations on the side of the farmer.

Methods

The legal requirements of Directive 98/58 were first arranged in a specific checklist, according to the categories reported in annex 1 to the above-mentioned directive (table 1).

Table 1. categorization of Directive 98/58 requirements included in the guidelines for the on-farm welfare assessment of commercial turkeys.

Staffing	
1	Number of stockpersons
2	Experience and training of stockpersons
Inspection	
3	Number of inspections of the animals
4	Lighting for inspection
5	Management of sick/injured birds
6	Killing
Record keeping	
7	Animal recording data
8	Register of treatments
Freedom of movement	
9	Space availability (kg/m ²)
Buildings and accommodation	
10	Adequacy of housing and structures
11	Facilities for sick animals
12	Temperature and humidity
13	Gas (ammonia and carbon dioxide) concentration
14	Air dust
15	Provision of sufficient light
16	Lighting program
17	Animals not kept in buildings br Breeding procedures
Automatic or mechanical equipment	
18	Inspection of equipment
19	Measures in case of equipment malfunction
20	Backup ventilation system
21	Alarm system
Feed, water and other substances	
22	Feed management

- 23 Feed distribution
 - 24 Water quality
 - 25 Feeding equipment
 - 26 Drinking equipment
 - 27 Administration of illegal substances
-

Mutilations

- 28 Mutilations
-

Breeding procedures

- 29 General requirements
-

The checklist was then structured taking the example of the Classyfarm checklists (www.classyfarm.it) used by the official inspectors in Italy, where each requirement can receive an evaluation of compliant (“INSUFFICIENT”) or non-compliant (“FAIR”) and where it was considered possible also a 3rd additional score was added: Optimal, (“OPTIMAL”) meaning that not only the requirement is compliant with Directive 98/58, but that the requirement is fulfilled beyond minimum legal requirements. As explained previously, these are examples derived from Classyfarm and each CA is of course free to choose different figures.

For each requirement listed, indications, taken mostly from the Classyfarm system, are provided in the guidelines to facilitate the assessment of each single requirement (item). The Classyfarm guidance was developed with the involvement of official veterinarians and scientists, but also with sectorial stakeholder involvement and is based on scientific literature, turkey welfare guidelines used on field and consultation of field specialists.

Finally, each recommendation listed is followed by a brief explanation of the subject, with the aim of illustrating more deeply the condition to be evaluated and helping the inspectors in their assessment.

Thresholds provided in the guidance are not legally binding but can be used as mere indications. Therefore, the inspector, when assessing a requirement, in case of deviations from the values suggested, can give a score of acceptable, if the overall assessment of the farm and animals does not raise welfare concerns. On the contrary if the overall assessment of the farm and the animals highlights animal welfare issues even when the thresholds are respected, the inspector can score the requirement as insufficient.

This aspect is highlighted by the following phrase: *"The suggested thresholds only represent a suggestion for the official inspectors, who should always consider every risk factor before expressing the evaluation"* which is reported in each requirement of the checklist where non legally binding thresholds are suggested.

The purpose of this deliverable is to provide a guideline to official inspectors for the assessment of the welfare of commercial turkeys kept in intensive production systems in compliance with the requirements of Directive 98/58/EC. The guidance provides also examples of best practices when the assessment of turkey welfare includes requirements beyond minimum requirements of Directive 98/58, taken from the COE Recommendations or other indications from Classyfarm which are an example but do not represent explicit legal obligations on the side of the farmer.

It can be a useful tool supporting EU official inspectors for a more uniform evaluation and ultimately to improve overall commercial turkey welfare.

In this regard, future refinements could be implemented to these guidelines once the specific EU legislation for turkey welfare will be issued.

Furthermore, animal-based indicators collected on farm following the transect method and the collection, registration and evaluation of indicators collected at slaughter, are future activities of EURCAW-PoultrySFA, and once finalized can be integrated in the present guidelines and will certainly improve the effectiveness of turkey welfare assessment on farm.

I Staffing

1 Number of stockpersons

"Animals shall be cared for by a sufficient number of staff who possess the appropriate ability, knowledge and professional competence." (Directive 98/58/EC, Annex, Paragraph 1).

Item 1	
Staffing (Category of assessment: staffing)	
"The animals are cared for by a sufficient number of staff."	
The suggested thresholds only represent a suggestion for the assessor, who should always consider every risk factor before expressing the evaluation.	
Inadequate number of staff: approximately one person for over 20,000 toms or 35,000 hens.	INSUFFICIENT
Adequate number of staff: approximately one person for 15,000-20,000 toms or 25,000-35,000 hens.	FAIR
Optimal number of staff: approximately one person for less than 15,000 toms or 25,000 hens.	OPTIMAL

Staff are those who work in full-time or part-time on the farm to carry out the operations of feeding and caring for animals and their environment. An adequate number of staff allows them to detect signs of poor animal welfare more promptly and in a timely manner. Given the variability of the farming systems and the level of automation of the farms, it is not always possible to define a suitable number of employees. Therefore, each evaluation must be made taking into consideration each single case based also on the use of iceberg indicators such as mortality, injured, dirty birds etc. The suggested thresholds provide as such only indications to be used along with other indicators such as the above-mentioned iceberg indicators. The thresholds indicated

have been developed with of official veterinarians and scientists, but also with sectorial stakeholder involvement. Toms require more effort to be cared for compared to hens, reason for which more staff is necessary in the farms rearing male turkeys. There are no specific animal based indicators (ABIs) although there are many indirect ABIs (iceberg indicators) allowing to evaluate the care given to animals (number of dead birds, decomposed carcasses, runts and stunts, injured birds, sick birds, flighty animals) that can be used as iceberg indicators to verify if the animals are sufficiently cared for, integrated with management base indicators (MBIs)(such as wet litter areas, leaking drinkers, lack of feed in the feeders, dust levels, noxious gas concentrations). However up to date the lack of agreed thresholds limit the usefulness of many of these indicators.

2 Training and guidance for persons dealing with turkeys - Training of the keeper.

"Animals shall be cared for by a sufficient number of staff who possess the appropriate ability, knowledge and professional competence." (Directive 98/58/EC, Annex, point 1).

"A solid period of training, including practical experience and continuous updating, are considered essential for those involved in turkey breeding" (EC 2001 article 4, point 2).

"To develop a positive relationship between man and bird, there should be frequent, calm but close contact from the first day after hatching so that the birds are not overly frightened [...]" (EC 2001 article 5, point 1).

Item 2

TRAINING AND GUIDANCE FOR PERSONS DEALING WITH TURKEYS

(Category of assessment: staffing)

"Staff members possess the appropriate ability, knowledge and professional competence".

Evaluate the overall competence of the animal husbandry staff, which can be either of practical origin (because provided by experience) or of theoretical origin (e.g. training course/ degree).

Long practical experience in the field might be considered sufficient or, in its absence (e.g. young farmers), the attainment of relevant qualifications (diploma or degree in agriculture, veterinary medicine and similar short degrees) or participation in specific training courses on animal welfare.

If both requirements: prolonged experience and a specific education/training qualification are met the item can be scored as optimal if training or refresher courses are repeated at regular intervals during the working period (at least 1 course every 3 years).

If the farm is run by several operators, the participation of even one employee (be it the owner or the hired employee) in the training courses is considered sufficient.

The limits indicated are only an aid for the assessor, who must in any case consider all the risk factors of the farm before making a judgement.

Indicative experience of less than 10 years and no animal welfare training courses	INSUFFICIENT
Indicative experience of at least 10 years and no animal welfare training/qualification (or combination thereof)	FAIR
Indicative experience of at least 10 years with relevant qualification or training followed within the last 3 years	OPTIMAL

As animal welfare is an evolving concept, it still needs to be properly disseminated among operators working closely with animals. For this reason, staff must be competent and well-motivated, and it is essential that they are informed and trained in the needs of animals so that they can prevent and manage problems.

Negative attitudes caused by abrupt, aggressive, or violent behaviours, determine a state of fear and stress in turkeys. It is important that the staff maintains a constant work routine, treating the animals calmly.

In this respect, having received instruction and training on animal welfare is considered fair, while participation in specific training courses on animal welfare and turkey rearing is necessary to assign the optimal judgment.

Training in turkey welfare is also essential for the staff of the catching team and the owner/keeper must verify that the catchers provide proof of being properly trained before handling the birds.

3 Number of inspections

"All animals kept in husbandry systems in which their welfare depends on frequent human attention shall be inspected at least once a day. Animals reared or kept in other systems shall be inspected at sufficient intervals in order to avoid any suffering" (Directive 98/58/EC, Annex, point 2). The flock or group of turkeys shall be thoroughly inspected at least twice a day, preferably more frequently, to gain a good indication of flock health and physical condition. Birds in hospital pens must be inspected more frequently. (COE 2001 Art. 7.1)

2. For the thorough overall inspection of the flock or group of birds, special attention shall be paid to vocalisation, movements, respiration, bodily condition such as the condition of plumage, eyes, skin, beak, legs, feet and claws; attention shall also be paid to the existence of any injuries, the presence of external parasites, to the condition of droppings, to feed and water consumption, to growth and to egg production. (COE 2001 Art. 7.2)

Item 3	
NUMBER OF INSPECTIONS <i>(Category of assessment: Inspection)</i>	
<p>"All animals kept in husbandry systems, in which their welfare depends on frequent human attention, shall be inspected at least once a day".</p> <p>The number of inspections that keepers do on a daily basis is important to assess as it is indicative of the attention they pay to the group of animals and thus the timeliness with which any welfare problems can be detected.</p> <p>The keeper or handlers should make a careful observation of all animals at least once a day.</p> <p>All turkeys in the establishment should be inspected, paying particular attention to signs that reveal a decline in the welfare and/or health status of the animals. Where there is a written/computerised record of problems found during inspections, the optimum rating can be assigned.</p>	
Less than 1 inspection/day	INSUFFICIENT
1 or more inspections/day	FAIR
2 or more inspections/day and written/informatic records of welfare problems encountered	OPTIMAL

All turkeys in the establishment must be inspected, paying special attention to the signs revealing a reduction in animal welfare and/or health.

The owner or the keeper should carefully observe all the animals kept inside the shed at least once a day, to promptly identify the potential dangers for the turkey welfare and health (including both behavioural or physiological needs) and provide rapid and effective interventions.

To achieve the highest score (optimum), the keeper should carefully inspect the birds at least twice a day, with particular attention to the injured turkeys housed in the hospital pen.

Moreover, the keeper (or other staff) should also record any clinical sign/anomaly/lesion seen in the flock or verify turkey's performance and data provided by the automatic systems.

The assessor should verify the compliance to the requirement through interviews and checking the Standard Operating Procedures. To give the "Optimal" score, the assessor should check if there are any written/computerized records of the problems encountered during the inspections.

4 Lighting available for inspection

"Adequate lighting (fixed or portable) shall be available to enable the animals to be thoroughly inspected at any time" (Directive 98/58/EC, Annex, point 3)

Item 4	
LIGHTING AVAILABLE FOR INSPECTION	
<i>(Category of assessment: Inspection)</i>	
<i>"To allow the complete inspection of the animals at any time, adequate fixed or mobile lighting must be available."</i>	
The light intensity should allow operators to adequately inspect all animals.	
In addition, fixed or movable lighting should be present to allow inspection of animals at any time, even at night, so that handlers can intervene carefully and safely.	
Absence of adequate lighting for the inspection	INSUFFICIENT
Presence of adequate lighting available for inspection	FAIR

All buildings must have light levels sufficient to allow all birds to be seen clearly. The daily inspection of animals by the farmer should be carried out by setting a light intensity slightly higher than that of a normal breeding situation, to allow him to easily recognize animals or equipment that present problems to be solved immediately. Likewise, inspection conducted by Public Veterinarians or private certification bodies must be able to have adequate lighting for their purposes. The assessor can verify compliance with the requirement simply by asking the breeder to increase the brightness of the environment.

5 Management of injured or ill animals

"Any animal which appears ill or injured must be cared for appropriately without delay and, where an animal does not respond to such care, veterinary advice must be obtained as soon as possible" (Directive 98/58/EC, Annex, point 4).

"It is an ethical duty to kill productive animals which are in severe pain where there is no economically viable way to alleviate such pain" (Reg. EC 1099/2009, Preamble 12).

Item 5

MANAGEMENT OF INJURED OR ILL ANIMALS

(Category of assessment: Inspection)

"Any animal which appears to be ill or injured must be cared for appropriately without delay and, where an animal does not respond to such care, veterinary advice must be obtained as soon as possible."

"It is an ethical duty to kill productive animals which are in severe pain where there is no economically viable way to alleviate such pain."

To obtain evidence that sick or injured animals receive appropriate treatment, check, by interviewing staff, whether precise instructions, including oral instructions, have been given.

Points to check:

1. Checking the immediate treatment and/or isolation of sick animals: this is done by verifying that sick or injured animals have received appropriate treatment and moved to an infirmary. Sick or injured animals should be inspected at least twice a day. Evaluate declarations and/or the presence of ongoing pharmacological treatments, in the treatment records;

2. Consultation with a veterinarian: check whether the presence of the company veterinarian or a freelance or private veterinarian attending the farm is declared or documented.

All conditions must be fulfilled to grant the compliant assessment.

Evidence of untrained staff and/or the presence of animals that need treatment and have not yet received it and/or the absence of a veterinarian monitoring the farm.	INSUFFICIENT
Presence of trained personnel and evidence that the two verification points above are met.	FAIR
In addition to the criteria for suitability, presence of relevant written procedures for handling animals.	OPTIMAL

Together with the daily inspection of the animals, it is of fundamental importance that the keepers and the employees notice any early signs of illness or discomfort in one or more birds and that they act promptly to resolve them.

At the time of evaluation, it is possible to assign the FAIR judgment if the sick or injured animals are managed according to the provisions of Directive 98/58/EC and Reg. EC 1099/2009

It is advisable to verify the correspondence between what was declared by the keeper and what is observed at the time of inspection of the shed. The inspector, during the inspection, must check if there are animals with evident signs of health deterioration, not properly managed by the keeper (for example several animals with inveterate wounds) (figure 2,3,4,5, 6).



Picture 2 - Animals on the ground, dying, with inveterate wounds caused by cannibalism, non properly managed by the keeper.



Picture 3. Turkey with a major scratch lesion under the wing.



Picture 4. Severely ill and small turkey.



Picture 5. Turkey with recent injury to the snood.



Picture 6. Dead turkey found during inspection.

6 Culling

" Any animal which appears to be ill or injured must be cared for appropriately without delay (...)." (Directive 98/58/EC, Annex, point 4).

"Killing and related operations shall only be carried out by persons with the appropriate level of competence to carry out such operations without causing the animals avoidable pain, distress or suffering". (EC Reg. 1099/2009, Chapter II, Article 7).

"In the case of emergency killing, the person having custody of the animals concerned shall take all necessary measures to kill the animals as quickly as possible" (EC Reg. 1099/2009, Chapter IV Article 19).

Article 25

"If turkeys are ill or injured to such an extent that treatment is no longer feasible and transport would cause additional suffering, they must be killed on the farm. This must be done without causing undue pain, agitation or other forms of distress and without delay by a person experienced in the techniques of killing unless in case of emergency when such a person is not immediately available". (COE 2001 Article 25.1).

Item 6	
CULLING	
<p>If turkeys are sick or injured to such an extent that treatment is no longer feasible and transport to the slaughterhouse would cause additional suffering, they must be killed on the farm using methods in accordance with EC Regulation 1099/2009. Ensure that these practices are carried out by competent personnel (e.g. suitably trained owner/keeper, euthanasia carried out by a veterinarian or use of personnel with a certificate of competence for killing) and that instructions are in place (e.g. training material of the course attended by the owner/keeper, emergency contact numbers, how to maintain equipment, etc.).</p>	
Failure to use competent personnel and/or lack of instructions provided to personnel and/or use of inadequate or improperly maintained equipment.	INSUFFICIENT
Culling carried out by a veterinarian, or by personnel with a certificate of competence for culling and/or have been instructed or trained to do so (e.g. presence of a training course with specific subject matter covered) and/or use of suitable and regularly maintained equipment.	FAIR
Presence of written procedures for the correct culling and distinct for the different animal categories, indicating responsibilities, tools and periodic checks to facilitate proper management of the emergency.	OPTIMAL

III Record Keeping

7. Keeping data records

Registration and the related storage procedures are carried out in accordance with the provisions of Directive 98/58/EC, (annex, point 5 and 6).

5. The owner or keeper of the animals shall maintain a record of any drug treatment given and of the number of mortalities found to each inspection. Where equivalent information is required to be kept for other purposes, this shall also suffice for the purposes of this Directive.

6. These records shall be retained for a period of at least three years and shall be made available to the competent authority when carrying out an inspection or when otherwise requested.

Item 7	
KEEPING DATA RECORDS	
<i>(Category of assessment: record keeping)</i>	
If abnormal mortalities have occurred, check that they have been correctly identified, recorded and reported.	
The owner/keeper of the animals doesn't have records of the medicinal treatment given or of the number of mortalities found to each inspection and are not retained for a period of at least three years.	INSUFFICIENT

The owner/keeper of the animals has records of the medicinal treatment given and of the number of mortalities found to each inspection and are retained for a period of at least three years.	FAIR
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8. Keeping the register of pharmacological treatments

"The owner or keeper of the animals shall keep a record of the therapeutic treatments carried out. The records and the manner in which they are kept shall be carried out in accordance with the provisions of Council Directive 96/22/EC and Council Directive 96/23/EC. The records are kept for a period of at least three years and are made available to the competent authority at the time of inspections or upon request" (Directive 98/58/EC, Annex Registration, points 5-6).

Item 8

KEEPING THE REGISTER OF PHARMACOLOGICAL TREATMENTS

(Category of assessment: Record keeping)

"The owner or keeper of the animals shall keep a record of the therapeutic treatments carried out. The records and the manner in which they are kept shall be carried out in accordance with the provisions of Council Directive 96/22/EC and Council Directive 96/23/EC. The records are kept for a period of at least three years and are made available to the competent authority at the time of inspections or upon request".

There is evidence of treatment records correctly written down.

Absence or incorrect recording of treatments.	INSUFFICIENT
Correct recording of treatments.	FAIR

The assessor verifies the presence and correct compilation of the treatment records by carrying out a spot check on at least two treatments. Recording of treatments are considered "fair" when type of treatment, the type of products authorized and the date of treatment are provided. The presence of the treatments performed is also necessary to ensure the verification of the correct and timely treatment of sick or injured animals.

IV Freedom of movement

9 Available space allowance

"The animal's freedom of movement, according to its species and in accordance with experience and scientific knowledge, must not be restricted in such a way as to cause it unnecessary suffering or injury." (Directive 98/58/EC, Annex, Freedom of Movement, point 7)

Item 9

AVAILABLE SPACE

(Category of assessment: Freedom of movement)

"The freedom of movement of an animal, having regard to its species and in accordance with established experience and scientific knowledge, must not be restricted in such a way as to cause it unnecessary suffering or injury."

If the animal does not have sufficient space available, it will move with greater difficulty, will not be able to avoid aggressive phenomena from other conspecifics and will not be able to rest peacefully. The density within the shed required for each animal must be calculated using the floor space available for the animals, which must be gradually adapted according to the animals' age, weight and level of management. The number of animals present at the time of assessment should be checked, multiplied by the average weight and divided by the area available to the animals.

There are no legal thresholds for stocking density of turkeys in the current European legislation

Stocking density is the amount of space available per animal to perform its needs it represents a resource-based indicator to assess freedom of movement. Stocking density can be expressed in different ways: kg/m², birds/m², cm²/bird, cm²/kg. The mostly used for meat producing birds is kg/m². In addition to the kg/m² specifications, it is important to simultaneously consider the number of birds/m², as the same weight per floor space limitation, results in a greater number of birds in the case of lighter turkeys and other aspects such as thinning.

First calculate the total dimension of useable space in which birds are kept in m² and then divide it by number of birds present (numbers or weight).

House area: measure internal dimensions of the house. If there is a farm statement for the house area – do a simple check by measuring house length by width to check that farm statement is correct. If no farm statement is available, measure house (length x width) and subtract for house

equipment (feeders, drinkers, structural elements of the building etc.) which reduce the space available to the birds. Furthermore, a practical approach to measuring large houses is to measure a section and multiply by the number of sections.

Number of animals: Ask for mortality figures to calculate the number of actual birds. Look for paper evidence of delivery numbers of birds and, after slaughter, the number of birds slaughtered, which should be quite accurate.

Weight loading: animal weights at a given age are often calculated by the animal unit manager by trial weighing a small number of birds. Some farms have step on automatic weighers, which can give average weights for the birds (however, small birds, sick birds, lame birds do not use the weighers). High stocking density impacts negatively the turkeys' behaviours and health by, for example, increasing litter moisture gait deterioration, increasing injurious pecking, decreasing the ability to perform natural behaviour such as exploration, foraging and comfort behaviours, and leading in most extreme cases to poor body mass gain or increased mortality (Marchewka et al., 2013; Erasmus, 2017; Krautwald-Junghanns and Sirovnik, 2022).

There are no legal thresholds for stocking density of turkeys in the current European Union legislation. It has been reported that stocking densities above 29,3 kg/m², increase mortality rate, reduce feed intake and live weight of animals. However, the studies on the effects of stocking density on turkey behaviour and welfare have been conducted on experimental groups of very different sizes than the reality of the commercial turkey industry. The thresholds used in commercial farms throughout the EU vary and in general are much higher than the outcomes of the experimental studies mentioned, and other factors also have to be considered within the farm that may affect the welfare of the animals raised (see EURCAW deliverable 2023-DL.3.1.2: Description of the main husbandry systems used for turkey farming in Europe).



Picture 7. Insufficient space available for animals.

The shed is overcrowded, the natural movements of animals are made difficult, turkeys stumble into the different structures (in photo the feeder).

V Buildings and accommodation

10. Buildings and accommodation

"Materials to be used for the construction of accommodation, and in particular for the construction of pens an equipment with which the animals may come into contact, must not be harmful to the animals and must be capable of being thoroughly cleaned and disinfected" (Directive 98/58/EC, Annex, point 8).

"Accommodation and fittings for securing animals shall be constructed and maintained so that there are no sharp edges or protrusions likely to cause injury to the animals" (Directive 98/58/EC, Annex, point 9).

Item 10

BUILDINGS AND ACCOMODATION

(Category of assessment: Buildings and accommodation)

"Materials to be used for the construction of accommodation, and in particular for the construction of pens an equipment with which the animals may come into contact, must not be harmful to the animals and must be capable of being thoroughly cleaned and disinfected". "Accommodation and fittings for securing animals shall be constructed and maintained so that there are no sharp edges or protrusions likely to cause injury to the animals."

Dirty, unmanaged and/or animal-harmful housing environments.

INSUFFICIENT

Clean and sufficiently managed housing environments.

FAIR

All materials, bedding and equipment used in relaying spaces, as well as the surfaces themselves, with which animals may come into contact, and any attachment devices used must not be harmful to animals and must not have sharp edges or protrusions capable of causing trauma or injury. At the same time, all such equipment must be designed, constructed and maintained in such a way that it can be thoroughly cleaned and disinfected.

11. Infirmary

"Where necessary sick or injured animals shall be isolated in suitable accommodation with, where appropriate, dry" (Directive 98/58/EC, Annex, point 4).

Item 11	
INFIRMARY	
<i>(Category of assessment: buildings and accommodation)</i>	
<i>"Where necessary sick or injured animals shall be isolated in suitable accommodation with, where appropriate, dry comfortable bedding"</i>	
There must be specific areas for sick and injured animals, easy to reach and to prepare when necessary; they must be clearly identified and equipped with comfortable bedding, clean water and feeding. Inside the infirmary density must be low to provide comfort to the animals.	
The suggested thresholds only represent a suggestion for the assessor, who should always consider every risk factor before expressing the evaluation.	
There is no suitable and identified accommodation for sick or injured animals.	INSUFFICIENT
There is at least 1 suitable and identified accommodation for sick or injured animals.	FAIR

Animals that are sick, injured or in distress must be promptly identified and cared for and, if necessary, separated from the rest of the group. For this reason, there must be (or it must be possible to set up) separate areas that can be reached immediately in case of need.

To ensure adequate comfort and care for the birds, the density within this room must be reduced.

This room can be separated from the rest of the shed by masonry walls, or it can be set up within the shelter, provided the sick animals are physically separated from the healthy ones (e.g. using wire mesh).

The assessor must directly observe the infirmary or check the area set up. Birds that cannot walk, or are unlikely to survive, should not be placed in this unit, but should be stunned and immediately put down in a humane manner, using means specific to the animal's age and weight, by trained personnel (as required by Regulation EC 1099/2009).

The assessor must directly observe the infirmary or check the area set up. Animals that cannot walk, or are unlikely to survive, should not be placed in this unit, but should be stunned and immediately put down in a humane manner, using means specific to the animal's age and weight, by trained personnel (as required by Regulation EC 1099/2009).



Picture 8. Example of an infirmary space present but not managed correctly: note the simultaneous presence of healthy animals and sick animals.



Picture 9. Example of a properly managed infirmary space.

12. Temperature and relative air humidity

"Air circulation, dust quantity, temperature, relative humidity of the air and gas concentrations must be kept within limits which are not harmful to the animals" (Directive 98/58/EC, Annex, point 10).

Item 12

TEMPERATURE AND RELATIVE AIR HUMIDITY

(Category of assessment: Buildings and accommodation)

"[...] temperature, relative air humidity [...] must be kept within limits which are not harmful to the animals. "

Temperature and relative humidity are parameters that are closely related to the ventilation system, so the assessor must consider both the presence and adequacy of the latter and the microclimatic conditions found at the time of the inspection when making the judgement.

The limits indicated are only an aid for the evaluator who must in any case consider all the risk factors of the farm before making a judgement.

Lack of mechanical ventilation.	INSUFFICIENT
Mechanical ventilation (air mixing fans or tunnel ventilation).	FAIR
Mechanical ventilation together with cooling and heating systems.	OPTIMAL

Animals in conditions of thermal stress (hot or cold) implement a series of physiological adaptation that have a negative impact on their welfare.

Ventilation of a shelter can be natural or mechanical. In the first case the openings are placed either on the roof (domes, chimneys) or directly in the walls of the shed and the air circulation inside the structure is ensured by the convective movements of hot air. This ventilation system can be conveniently used only in temperate climates and in the presence of low animal density. In intensive farming system, characterized by high stocking densities only with mechanical ventilation and environmental conditioning the microclimatic conditions can be adequately controlled (figures 10 and 11).

It is advisable to ensure air circulation at a minimum speed of 4.0 m³/h/kg for females and 5.0 m³/h/kg for males, in order to obtain acceptable levels of air quality in the summer, in case of closed shelter with forced ventilation. Under physiological conditions the body temperature of a turkey is between 41°C and 42.2°C (VKM, 2016). Thermal well-being conditions range are from 30°C-34°C in the first weeks of age and reach 16°C-17°C at 20 weeks (Hendrix Genetics, 2015). Above 5 weeks of age, the temperature may vary + or – di 1.7°C. Relative humidity should be maintained between 50% and 70%. Lower humidity levels can make the environment excessively dusty, while levels are too high by increasing litter moisture and ammonia concentration. To verify compliance with the item, the evaluator must consider the type of ventilation present in the shed. The presence of mechanical ventilation is considered acceptable, through the use of air mixing fans. or tunnel ventilation, the presence of tunnel ventilation systems will be optimal, with cooling and heating systems.



Figure 10. Example of shed with mechanical ventilation system (agitators)



Figure 11. Example of a forced ventilation shed with cooling systems

13. Harmful gases

"Air circulation, dust level, temperature, relative humidity must be kept within limits which are not harmful to the animals" (Directive 98/58/EC, Annex, point 10).

Item 13

HARMFUL GASES

(Category: Buildings and accommodations)

"[...] Gas concentrations must be kept within limits which are not harmful to the animals."

During the breeding evaluation, ammonia levels of less than 20 ppm and carbon dioxide levels of less than 3,000 ppm are considered acceptable. In the case of inadequate gas concentrations (e.g. $\text{NH}_3 > 20$ ppm), the following symptoms can be detected in animals: redness of the conjunctivae and lacrimation; these symptoms can also be perceived by the official veterinarian, with the strong typical pungent odour in the housing environment. If an unsuitable condition is suspected, it is necessary to confirm the condition by measuring the concentration of noxious gases on the farm using a portable gas detector to be placed in the middle of the shed at the height of the animals. If this instrument is not available, in the case of farms with no particular odours or signs that may indicate poor air quality, it is considered possible to assign the rating "acceptable" without necessarily measuring the gases.

The limits given are only an aid to the assessor, who must in any case consider all the risk factors of the farm before making a judgement.

Gas concentrations above the Thresholds of: $\text{NH}_3 > 20$ ppm; $\text{CO}_2 > 3000$ ppm).	INSUFFICIENT
Gas concentrations below or equal to the thresholds: $\text{NH}_3 < 20$ ppm; $\text{CO}_2 < 3000$ ppm).	FAIR

Animal health and welfare are largely influenced by the concentration of certain gases in the air, such as ammonia and carbon dioxide; there are numerous managements or structural factors that can affect this parameter (e.g. the weight of the animals, their density, flooring, bedding, etc.). Poor litter management, for example, can lead to an increase in the level of gas emissions with a worsening of air quality, which is also largely influenced by ventilation. Proper air exchange

prevents increased levels of these noxious gases and promotes the removal of dust and pathogens.

The concentration of gases can be measured on the farm by means of a portable detector to be placed at the height of animals' head. If this instrument is not available, in the case of farms with no particular odour or signs that may indicate poor air quality, it is considered possible to assign the rating "acceptable" without necessarily measuring the gases.

14. Air dust

"Dust levels, [...] must be kept within limits which are not harmful to the animals". (Directive 98/58/EC, Annex, buildings and stabling premises, point 10).

Item 14

AIR DUST

(Category of assessment: Buildings and accommodation)

"Dust levels, [...] must be kept within limits which are not harmful to the animals".

In practice, to assess air dustiness quickly and easily, we recommend the use of the 'Dust sheet Test', described in the Welfare Quality® poultry welfare assessment protocol (2009). The method involves the use of a black A4 sheet of paper, which is placed on a horizontal surface high enough to avoid contact with the animals, preferably away from the feed chain, when they enter the shed. The sheet of paper should be removed after 2 hours, and a finger should be run over its surface to get an impression of the amount of dust that has settled in the meantime.

Classify the dust level as follows: A. Absence of dust; B. Slight presence of dust; C. Slight coverage; D. A lot of dust; E. Paper colour is hidden by dust.

Insufficient rating is given for dusty conditions D and E; fair rating for C and B; optimum for A.

The limits given are only an aid to the assessor who must in any case consider all the risk factors of the farm before making a judgement.

Dust levels are harmful to the animals (D and E).	INSUFFICIENT
Dust levels are not harmful to the animals (B and C).	FAIR
There is no dust (A).	OPTIMAL

On poultry farms, the dustiness of the air is generally caused by lifting particles of skin, feed, litter, dry manure and feathers. When these particles are released into the air, they can increase the animal's susceptibility to certain diseases, through an irritant action, or trigger allergic reactions (Harry, 1978). To achieve sufficient levels of dustiness, it is recommended to ensure air circulation at a minimum speed of 3.66 m³/h/kg.

In practice, to assess dustiness in the air quickly and easily, the 'paper dust test' described in the Welfare Quality® poultry welfare assessment protocol (2009) can be used. The method involves the use of a black A4 sheet of paper, which is placed on a horizontal surface high enough to avoid contact with the birds, preferably away from the feed chain, when they enter the shed. At the end of the evaluation, the sheet of paper is removed, and a finger is run over its surface to get an impression of the amount of dust that has settled in the meantime.

15. Light levels

"Animals kept in buildings must not be kept either in permanent darkness or without an appropriate period of rest from artificial lighting" (Directive 98/58/EC, Annex, point 11).

Item 15	
LIGHT LEVELS	
<i>(Category: Buildings and accommodation)</i>	
<i>"If natural light is insufficient to meet the behavioural and physiological needs of animals, adequate artificial lighting should be provided"</i>	
Artificial light sources should be installed so as not to cause discomfort to the animals. In the case of suspicion of an inadequate condition, it is necessary to confirm with luxmeters.	
Absence or insufficiency of natural or artificial lighting.	INSUFFICIENT
Presence of adequate natural or artificial.	FAIR

Light is a key parameter, as it influences production activity in both sexes. Naturally lighted turkey farms must be equipped with openings for the entry of natural light, the surface area of which

must correspond to at least 3% of the floor area in order to ensure adequate light distribution over the entire area of the shed (Verband deutscher Putenerzeuger, 2013).

It is advisable to measure the light intensity at the level of the animals' eyes and at different points (above the feeding line, bedding, near the drinking line...) to check that it is evenly distributed.

"All buildings shall have light levels sufficient to allow all birds to see one another and be seen clearly, to investigate their surroundings visually and to show normal levels of activity. The minimum illumination level shall be 10 Lux at bird eye level, measured as the average in 3 planes at right angles to each other. As far as practicable, natural light shall be provided. In this case, light apertures should be arranged in such a way that light is distributed evenly within the accommodation. Reduction in light level may be used as an emergency measure only if a significant amount of injurious pecking is occurring. (COE 2021 Art. 16)

16. Light program

"Animals kept in buildings must not be kept constantly in the dark or exposed to artificial lighting without an adequate rest period. If the available natural light is insufficient to meet the behavioural and physiological needs of the animals, adequate artificial lighting must be provided". (Directive 98/58/EC, Annex, buildings and livestock buildings, point 11)

The lighting regime shall be such as to prevent health and behavioural problems. Therefore, after conditioning of the poults to the housing system used, it shall follow a 24-hour cycle and include uninterrupted dark and light periods, as a guideline 8 hours, but no less than 4 hours.

To avoid injury to the birds, twilight periods should be provided in the dimming and raising of light". (COE 2021 Art. 16)

Item 16

LIGHT PROGRAM

(Category of assessment: Buildings and accommodation)

"Animals should not be kept constantly in the dark or exposed to artificial lighting without an adequate rest period".

The light must indicatively follow a 24-hour cycle and include a sufficient and uninterrupted period of darkness, indicatively about one third of the day. To verify compliance with the requirement, the inspector

may interview the farmer or, if present, check the light schedule set on the control unit. After considering all the above factors, the evaluator will be able to assign an improved rating if lighting control systems, so-called "dimmers", have been installed on the farm that can recreate sunrise and sunset with a gradual transition from light to dark in about one hour.

The limits indicated are only an aid for the assessor, who must in any case consider all the risk factors of the farm before making a judgement.

Light program does not follow a 24-hour cycle and include a sufficient and uninterrupted period of darkness.	INSUFFICIENT
Light program follows a 24-hour cycle and include a sufficient and uninterrupted period of darkness.	FAIR
Light program follows a 24-hour cycle and include a sufficient and uninterrupted period of darkness, and the house is equipped with light dimmers.	OPTIMAL

To maximize performance, photoperiod control is normally applied, through modulation of light intensity and hours of light provided. In shelters with natural lighting, artificial lighting is generally combined to supplement the natural source and extend the daily light hours.

To guarantee the turkey's well-being, the lighting system inside the shed must guarantee

- At least 8 hours of continuous light, which should be provided during natural daylight hours.
- At least 8 hours of continuous darkness, which should be provided during night hours, except when the birds are reared under natural light conditions and the dark period is short or in birds less than 3 days old.

During the light period, no area within the shed should be left at a light intensity of less than 20 lux. However, turkeys may benefit from the presence of different light intensities within the shed, as the darker areas allow the animal to rest, while the brighter areas allow them to carry out normal activities and reduce cannibalism (RSPCA, 2017).

Regarding the type of lighting, incandescent or fluorescent lamps may be used.

The inspector verifies the compliance of the farm examined with current regulations and the presence and effective application of a lighting programme suitable for the welfare and physiology of the animals.

It is advisable to measure the light intensity at the level of the animals' eyes and at different points (above the feeding line, bedding, near the drinking line...) to check that it is evenly distributed.

After considering all the above factors, the evaluator will be able to assign a better rating if the farm has lighting control systems, so-called 'dimmers', capable of recreating sunrise and sunset with a gradual transition from light to dark in about an hour.



Figure 13. Example of adequate lighting.



Figure 14. Example of insufficient lighting.

17. Presence of shelters in outdoor areas for animals kept outside the buildings

"Animals kept outside buildings must be provided, according to need and possibility, with adequate shelter from the weather, predators and health risks." (Directive 98/58/EC, Annex, Animals kept outside buildings, point 12).

Item 17	
Presence of shelters in outdoor areas for animals kept outside the buildings <i>(Category assessment: Buildings and accommodation)</i>	
<i>"Animals kept outside buildings must be provided, according to need and possibility, with adequate shelter from the weather, predators and health risks."</i>	
Shelters are considered both natural (trees, caves, etc.) and artificial (canopies, shelters, etc.) provided they offer adequate shelter, depending on the season and location.	
Absence, insufficiency or presence of inadequate shelters for even one group of animals.	INSUFFICIENT
Presence of sufficient and adequate shelters for all animals.	FAIR
Presence of easily accessible, sufficient and suitable shelters to protect all animals from environmental hazards.	OPTIMAL

Under free range conditions a freely accessible shelter must be provided to protect animals from adverse weather conditions. The shelter shall be large enough to contain all birds at the same time and its floor shall be kept dry.

VI Automatic and Mechanical equipment

18. Inspection of automated and mechanical equipment

"All automated or mechanical equipment essential for the health and well-being of the animals must be inspected at least once daily. Where defects are discovered, these must be rectified immediately, or if this is impossible, appropriate steps must be taken to safeguard the health and well-being of the animals." (Directive 98/58/EC, Annex, point 13).

Item 18	
INSPECTION OF AUTOMATED AND MECHANICAL EQUIPMENT	
<i>(Category of assessment: Automatic or mechanical equipment)</i>	
<i>"All automated or mechanical equipment essential for the health and well-being of the animals must be inspected at least once daily"</i>	
The ventilation system (window release systems, agitators, etc.) and the feed distribution system (auger, distribution system, etc.) can be considered automatic or mechanical systems that are indispensable for the welfare of the birds; they must therefore be inspected once a day and any defects found eliminated immediately.	
Automated and mechanical equipment are inspected less than once daily.	INSUFFICIENT
Automated and mechanical equipment are inspected at least once daily.	FAIR
Automated and mechanical equipment are inspected 2 or more times a day and there are written or computerized records of inspections (e.g. Number of inspections, failure, corrections).	OPTIMAL

19. Inspection of automated and mechanical equipment

"[...] Any defects found must be rectified immediately; if this is not possible, appropriate measures must be taken to safeguard the health and welfare of the animals. [...]" (Directive 98/58/EC, Annex, point 13).

Item 19
INSPECTION OF AUTOMATED AND MECHANICAL EQUIPMENT

(Category of assessment: Automatic or mechanical equipment)

"[...] Any defects found must be rectified immediately; if this is not possible, appropriate measures must be taken to safeguard the health and welfare of the animals. [...]"

Any problems found during daily inspections of automatic and mechanical installations must be rectified immediately. The official veterinarian must verify the proper functioning of these installations or check by interview what action the farmer takes immediately following the occurrence of the problem. Improved judgement can be given if there is a documented plan for dealing with emergency situations or incidents that may threaten animal welfare (damage to feeding/watering facilities, fire, extreme weather conditions)

Detection of a failure in the automated and mechanical equipment / Managing measures are inadequate to safeguard the health and well-being of animals.	INSUFFICIENT
Written records about the early resolution of emergency situation and/or managing measures are adequate to safeguard the health and well-being of animals.	FAIR
Written records about the early resolution of emergency situation and/or managing measures are adequate to safeguard the health and well-being of animals and there is a documented plan about managing emergency situation or accidents.	OPTIMAL

If any problems are detected during daily inspections of automatic and mechanical installations these must be immediately solved. The inspector must verify that written records about inspection and the early resolution of eventual emergencies Improved judgement can be given if there is a documented plan for dealing with emergency situations or incidents that may threaten animal welfare (damage to feeding/watering facilities, fire, extreme weather conditions)

20. Inspection of automated and mechanical equipment

"[...] Appropriate measures must be taken to safeguard the health and welfare of the animals. If the health and welfare of the animals depends on an artificial ventilation system, an appropriate back-up system must be provided to ensure sufficient air exchange to safeguard the health and welfare of the animals." (Directive 98/58/EC, Annex, point 13).

Item 20

INSPECTION OF AUTOMATED AND MECHANICAL EQUIPMENT

(Category of assessment: Automatic or mechanical equipment)

"[...] Appropriate measures must be taken to safeguard the health and welfare of the animals. If the health and welfare of the animals depends on an artificial ventilation system, an appropriate back-up system must be provided to ensure sufficient air exchange to safeguard the health and welfare of the animals."

The presence of a functioning back-up system in the event of an emergency is essential to ensure an adequate exchange of air (e.g. mechanical window-opening system); to this end, it is important to verify its functionality and constant maintenance. If the farm does not need a forced ventilation system (e.g. suitable natural air circulation) the requirement is considered not applicable. An improvement judgement can be made in the presence of a documented plan for handling emergency situations or incidents that may threaten animal welfare (failure of artificial ventilation systems), described in the Good Practice Manuals.

Absence/inadequacy of back-up equipment in case of artificial ventilation.	INSUFFICIENT
Presence of an adequate back-up facility.	FAIR
Additional presence of a written emergency plan.	OPTIMAL

Automatic installations that may have an effect on the welfare of the animals (automatic feeding systems, ventilation, etc.), must be checked daily and maintained regularly to ensure their proper functioning. Where such installations are essential for the welfare of the animals (e.g. ventilation systems or water and feed feeding devices), they must be equipped with alarm systems, which in turn must be checked for effectiveness, in order to signal faults or malfunctions in time.

21. Alarm system

"If the health and welfare of the animals depends on an artificial ventilation system [...] In the event of failure of the system, an alarm system must be provided to signal the failure. This alarm system must be checked regularly." (Directive 98/58/EC, Annex, automatic or mechanical systems, point 13).

Item 21

ALARM SYSTEM

(Category of assessment: Automatic or mechanical equipment)

"If the health and welfare of the animals depends on an artificial ventilation system [...] In the event of failure of the system, an alarm system must be provided to signal the failure. This alarm system must be checked regularly."

Where an artificial ventilation system with only forced ventilation is present and necessary for the health and welfare of the animals, an alarm system should be provided to signal any malfunction to the farmer. The alarm system should be checked regularly, especially if its malfunction would seriously endanger the health and welfare of the animals. If the farm does not require a forced ventilation system (e.g., suitable natural air circulation), the requirement is considered not applicable.

Lack of an alarm system for the artificial ventilation equipment.	INSUFFICIENT
Presence of an alarm system for the ventilation equipment.	FAIR
Presence of an alarm system regarding not only the ventilation system but also other devices essential for the health and well-being of the animals.	OPTIMAL

Where an artificial ventilation system with forced ventilation only is present and necessary for the health and welfare of the animals, an alarm system should be provided to signal any failure to the farmer, as well as an appropriate replacement system that, when necessary, allows sufficient air exchange for the animals present, while waiting for the failure to be corrected (e.g., emergency opening of windows/electric generator, etc.).

The alarm system and replacement system should be checked regularly, especially if their failure would seriously endanger the life, health and welfare of the animals.

If the farm does not require a forced ventilation system (e.g., presence of openings to the outside such as to generate air circulation; grazing, etc.) the requirement is considered not applicable.

VII Feeding, watering and administering other substances

22. Feeding management

"Animals shall be provided with a wholesome diet appropriate to their age and species and in sufficient quantity to keep them healthy and meet their nutritional needs. Food or liquids shall be fed to animals in such a way that it does not cause them unnecessary suffering or injury and does not contain substances that may cause unnecessary suffering or injury" (Directive 98/58/EC, Annex, feed, water and other substances, point 14).

Item 22	
FEEDING MANAGEMENT	
<i>(Category of assessment: feeding, watering and administration of other substances)</i>	
<i>"Animals shall be provided with a wholesome diet appropriate to their age and species and in sufficient quantity to keep them healthy and meet their nutritional needs. Food or liquids shall be fed to animals in such a way that it does not cause them unnecessary suffering or injury and does not contain substances that may cause unnecessary suffering or injury"</i>	
Feeding systems should allow each individual to meet his or her needs for quantity and quality of food. The diet should provide sufficient energy, nutrients and dietary fibre such that the nutritional requirements are met, and the digestive and metabolic physiology of the animals is respected.	
In order to meet the nutritional requirements of animals and ensure that the diet is appropriate for their body development, physiological state, and production level, it is necessary to have a specifically calculated ration for each stage of the cycle. The proper feeding of animals is also linked to the quality of the food and water comprising it, which must be of known origin and stored in suitable environments (e.g., silos, warehouses, water distribution system) to avoid alteration and contamination with toxic-harmful substances.	
Diet is not appropriate to animals' needs and/or it is not made up of wholesome food.	INSUFFICIENT
Diet is appropriate to animals' needs and it is made up of wholesome food.	FAIR

The inspector must verify the quality and healthiness of the feed that is administered to the birds, by checking the feed labels and assessing the suitability of the feed storage environment. Feed must be fresh and not left in a contaminated (i.e. mouldy, wet, soiled with rodent faeces). The inspector must verify the adequacy of the feed to the needs of the animal at that specific stage of the cycle, both in composition and in quantity and intervals of administration. It is advisable to ask the keeper to show the table of daily weight gains provided by the producing company and the composition of the feed. The proper nutrition's of the animals is also linked to the quality of

the foods that compose it, which must be of known origin and stored in environments (e.g. silos, warehouses and barns) suitable to avoid alterations and contamination with toxic-harmful substances. The feed label and tags affixed to the silos must always be present verifiable. The food program should provide for the constant use of the same ingredients to avoid that, in the transition from one diet to the next, enteric problem are established. The transition between one diet and another should take place gradually, for example, by mixing the two ration for 1-2 days.

23. Type of feeding

"All animals must have access to feed at intervals appropriate to their physiological needs." (Directive 98/58/EC, Annex, feed, water and other substances, item 15).

Item 23	
TYPE OF FEEDING	
<i>(Category of assessment: feeding, watering and administration of other substances)</i>	
<i>"15. All animals shall have access to feed at intervals appropriate to their physiological needs."</i>	
Feeding should be administered ad libitum to ensure each animal feeds as needed during the 24 h. In the case of fractional feeding, feedings should be ensured almost constantly throughout the 24 h, and preferably given on at least two occasions.	
Access to feed at inadequate intervals: indicatively feed not provided for more than 12 hours and/or distributed at intervals not appropriate to the physiological needs of the animals.	INSUFFICIENT
Access to feed at appropriate intervals: indicatively feed provided at least every 12 hours and properly distributed with intervals appropriate to the physiological needs of the animals.	FAIR

Diet should provide enough energy, nutrients and fibre to meet nutritional requirements of turkeys. In general, it is best to have an expert nutritionist and staff responsible for feed preparation and distribution. To achieve performance goals, while still maintaining adequate nutrition for age and species, turkeys must be able to regularly consume the required amount of feed (table 1).

Table 1 – Ingestion capacity of food, expressed in average value per week of age.

<i>Period</i>	<i>Males</i>	<i>Females</i>
<i>1st week</i>	15g	15g
<i>5th week</i>	100g	90g
<i>10th week</i>	300g	250g
<i>15th week</i>	500g	400g
<i>20th week</i>	650g	500g
<i>24th week</i>	750g	---

The first period represents the most critical stage of turkey feeding, since animals must be stimulated to feed. In this phase, to ensure proper growth, it is important to respect the protein needs, while in the subsequent phases, the coverage of energy needs will become more important (table 2).

Any factor that results in a delay or discourages animals from feeding will slow down the development process. For this reason, in addition to the nutrient content, the physical shape of the feed is also important: generally, in the first period, it is administered in the form of crumbled, while in the subsequent stages of pelleted.

The pellets administered to the animals must be homogeneous, with adequate durability and the fine particles (<1mm) must be kept a minimum level, below 10% (picture 13). It is advisable to use a portable feed sieve (picture 14) to quantify the size distribution of fine particles. It is also essential to keep the feeders clean, avoiding the increase of fine particles (picture 15).

Table 2. Nutritional requirements of turkey (expressed in % or unit per kg of food as is; a standard value of 90% dry matter is considered) (Amended by NRC, 1994)
Turkeys in fattening (males and females)

Nutrients	Unit	0 to 4 weeks; 0 to 4 weeks; 2,800	4 to 8 weeks; 4 to 8 weeks; 2,900c	8 to 12 weeks; 8 to 11 weeks; 3,000c	12 to 16 weeks; 11 to 14 weeks; 3,100c	16 to 20 weeks; 14 to 17 weeks; 3,200c	20 to 24 weeks; 17 to 20 weeks; 300c
Protein and Amino acids							
Proteind	%	28.0	26	22	19	16.5	14
Arginine	%	1.6	1.4	1.1	0.9	0.75	0.6
Glycine + serine	%	1.0	0.9	0.8	0.7	0.6	0.5
Histidine	%	0.58	0.5	0.4	0.3	0.25	0.2
Isoleucine	%	1.1	1.0	0.8	0.6	0.5	0.45
Leucine	%	1.9	1.75	1.5	1.25	1.0	0.8
Lysine	%	1.6	1.5	1.3	1.0	0.8	0.65
Methionine	%	0.55	0.45	0.4	0.35	0.25	0.25
Methionine + cystine	%	1.05	0.95	0.8	0.65	0.55	0.45
Phenylalanine	%	1.0	0.9	0.8	0.7	0.6	0.5
Phenylalanine + tyrosine	%	1.8	1.6	1.2	1.0	0.9	0.9
Threonine	%	1.0	0.95	0.8	0.75	0.6	0.5
Tryptophan	%	0.26	0.24	0.2	0.18	0.15	0.13
Valine	%	1.2	1.1	0.9	0.8	0.7	0.6
Fat							
Linoleic acid	%	1.0	1.0	0.8	0.8	0.8	0.8
MACROMINERALS							
Calciume	%	1.2	1.0	0.85	0.75	0.65	0.55
Nonphytate phosphorusf	%	0.6	0.5	0.42	0.38	0.32	0.28
Potassium	%	0.7	0.6	0.5	0.5	0.4	0.4
Sodium	%	0.17	0.15	0.12	0.12	0.12	0.12
Chlorine	%	0.15	0.14	0.14	0.12	0.12	0.12
Magnesium	mg	500	500	500	500	500	500
Trace minerals							
Manganese	mg	60	60	60	60	60	60
Zinc	mg	70	65	50	40	40	40
Iron	mg	80	60	60	60	50	50
Copper	mg	8	8	6	6	6	6
Iodine	mg	0.4	0.4	0.4	0.4	0.4	0.4
Selenium	mg	0.2	0.2	0.2	0.2	0.2	0.2
Fat soluble vitamins							
A	IU	5,000	5,000	5,000	5,000	5,000	5,000
D3g	ICU	1,100	1,100	1,100	1,100	1,100	1,100
E	IU	12	12	10	10	10	10
K	mg	1.75	1.5	1.0	0.75	0.75	0.50
Water soluble vitamins							
B12	Mg	0.003	0.003	0.003	0.003	0.003	0.003
Biotinh	Mg	0.25	0.2	0.125	0.125	0.100	0.100
Choline	Mg	1,600	1,400	1,100	1,100	950	800
Folacin	Mg	1.0	1.0	0.8	0.8	0.7	0.7
Niacin	Mg	60.0	60.0	50.0	50.0	40.0	40.0
Pantothenic acid	Mg	10.0	9.0	9.0	9.0	9.0	9.0
Pyridoxine	Mg	4.5	4.5	3.5	3.5	3.0	3.0
Riboflavin	Mg	4.0	3.6	3.0	3.0	2.5	2.5
Thiamin	Mg	2.0	2.0	2.0	2.0	2.0	2.0



Picture 13. Example of pellets suitable for a finishing diet.



Figure 14. Portable feed sieve.



Picture 15. Feed with excessive presence particles.

The feeding program should provide for the constant use of the same ingredients to avoid that, in the transition from one diet to the next, enteric problems are established. The transition between one diet and another should take place gradually, for example, by mixing the two rations for 1-2 days.

It is advisable to ask the keeper to show the table of daily weight gains provided by the producing company and the composition of the feed.

The proper nutrition of the animals is also linked to the quality of the foods that compose it, which must be of known origin and stored in environments (e.g. trenches, silos, warehouses and barns) suitable to avoid alterations and contamination with toxic-harmful substances. The feed label and tags affixed to the silos must always be present and verifiable.

The assessor must then verify the quality and healthiness of the food that is administered to the animal, by observing the tags placed on the silos and assessing the suitability of the environments

responsible for storing the feed and then verify the adequacy of the ration administered to the needs of the animal at that specific stage of the cycle, both in composition and in quantity and intervals of administration, considering the breeding system. As an aid, the evaluator is advised to obtain the rationing plan used in the company.

24. Water quality

"All animals must have access to a suitable water supply or be able to satisfy their fluid intake needs by other means" (Directive 98/58/EC, Annex, point 16).

Item 24	
WATER QUALITY	
<i>(Category of assessment: feed, water and other substances)</i>	
<i>"All animals must have access to a suitable water supply or be able to satisfy their fluid intake needs by other means"</i>	
<p>In animal husbandry, there are no specific standards regarding the quality characteristics of water for animal drinking, but it is good practice to make sure that the water for drinking is of good quality and clean. It is necessary to evaluate the water supply:</p> <ul style="list-style-type: none"> - Aqueduct water: it can be considered of adequate quality. Check actual consumption from meters and/or bills to make sure that it is indeed only aqueduct water and not mixed with water from different sources <ul style="list-style-type: none"> - Well water or surface water (e.g., lake): checks should be conducted on any treatment (chlorination, filtration, purification) and possibly microbiological type quality (at least every two years is recommended, barring any special problems). To assess compliance with the requirement, the Official Veterinarian may consider: <ul style="list-style-type: none"> - the type of supply - any water treatments and their type - the analytical characteristics assessed by periodic analysis - the visual inspection of the water coming out of the drinking troughs. - Annual analytical and microbiological monitoring and the presence and completeness of an SOP related to water quality management are considered optimal. <p>The quality of drinking water is assessed. Refer to the item "Availability of drinking troughs" for assessment of the amount of water available.</p> <p>The limits given are only an aid to the evaluator who will still need to consider all the risk factors of the farm before making the judgment.</p>	
Well or surface water not subjected to appropriate treatment or analytical controls.	INSUFFICIENT
Aqueduct or well/surface water subjected to appropriate treatment or analytical and microbiological testing at least every two years.	FAIR

<p>Aqueduct or well/surface water subjected to at least one analytical and microbiological control per year and presence of an operational procedure related to treatment and examination management.</p>	<p>OPTIMAL</p>
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In the zootechnical field, there are no specific rules concerning the quality characteristics of water intended for watering animals. The national legislation governing quality of water for human use is L. D. 2 February, n. 31; it is considering parameters

- microbiological parameters (i.e. E. coli, enterococchi);
- chemical parameters (nitrates, nitrites, heavy metal, arsenic, chromium, copper, lead, mercury, etc.);
- "indicators" (colour, odour, taste, turbidity, hardness, presence of aluminium, ammonium, chloride, iron, manganese, sulphate, sodium, coliform bacteria at 37°C, etc.).

However, water intended for animal consumption should be clear with no organic suspended matter, because poor quality water can cause health problems, reduced performances, damage to equipment, therefore it should be monitored to ensure purity and freedom from pathogens: a total water quality test should be done at least once a year and more often if they are perceived water quality issues or performance problems.

In order to verify the compliance to item 24, the assessor should consider:

- results of the last water analysis;
- visual inspection of water leaking through drinkers;

evidence and adequacy of a SOP regarding water quality management.

25. Availability of feeders

"Equipment for the administration of feed and water must be designed, constructed and installed in such a way as to minimize the possibility of contamination of food or water and the negative consequences deriving from rivalities between animals" (Directive 98/58/EC, Annex, point 17).

Item 25

AVAILABILITY OF FEEDERS

(Category of assessment: feed, water and other substances)

“Feeding and watering equipment must be designed, constructed and placed so that contamination of food and water and the harmful effects of competition between the animals are minimized.” (Directive 98/58/EC, Annex, point 17).

Different types of feeders, usually circular or linear, are used for feeding. The spaces for each type of feeder (in cm) and age (weeks) are given below: 0-22 weeks (Linear: 1.9; Circular: 1.52); 12-22 weeks (Linear 3.8; Circular 3.04). In case of linear feeder, the space needed per turkey is calculated as linear feeder space per turkey when both sides of the feeder are available. If only one side of the feeder is available, the required space indicated should be doubled.

The limits given are only an aid to the evaluator who must still consider all the risk factors of the farm before making the judgment

Feeding equipment is not designed, constructed and placed in an adequate way.	INSUFFICIENT
Feeding equipment is designed, constructed and placed in an adequate way.	FAIR

For the administration of the feed, different types of feeders are used, generally circular or linear. Since there are no specific legislative indications for the species, adequate standards have been chosen, through an accurate bibliographic survey, to cover all types of feeders used and to ensure that the number and size of the feeders are such as to prevent competition during the feeding phases.

Below is an indication, taken from a bibliographic survey, which can help the evaluator in expressing the judgment (table 3).

Table 3. Minimum feeding space for turkey (cm)¹ (da Federation of Animal Science Societies 2010 modified).

Age (weeks)	Type of feeder	
	Linear	Circular
0-12	1,9	1,52
12-22	3,8	3,04

¹ The space needed for turkey is calculated as linear space feeder for turkey when both sides of the feeder are available. If only one side of the feeder is available, the necessary space indicated must be doubled.



Picture 16. Type of circular feeding bin.

26. Availability of drinkers

"All animals must have access to an appropriate quantity of water, of adequate quality, or must be able to meet their needs for absorption of liquids in other ways" (Directive 98/58/EC, Annex, point 16).

"Feeding and watering equipment must be designed, constructed and placed so that contamination of food and water and the harmful effects of competition between the animals are minimized." (Directive 98/58/EC, Annex, point 17).

Item 26

AVAILABILITY OF DRINKERS

(Category of assessment: feed, water and other substance)

"Watering equipment [...] must be designed, constructed and placed so that contamination of water and the harmful effects of competition between the animals are minimized"

Different types of drinkers, usually bell, cup, or linear, are used for water supply. The spaces for each type of drinker (in cm) and age (weeks) are given below:

FEMALE 0-16.5 weeks (Linear: 1.27 cm; Bell-shaped: 1.02 cm Cup-s: 1 per 10 turkeys); MALE 0-8 weeks (Linear 1.27 cm; Bell-shaped: 1.02 cm; Cups: 1 per 20 turkeys); 8-16 weeks (Linear 1.91 cm; Bell-shaped: 1.53 cm; Cups: 1 per 10 turkeys); 16-20 weeks (Linear 2.54 cm; Bell-shaped: 2.03 cm; Cups: 1 per 10 turkeys). In case of linear troughs, the minimum space required for troughs is calculated as linear trough space per turkey. If only one side of the trough is available, the necessary space indicated must be doubled.

The limits given are only an aid to the inspector who must still consider all the risk factors of the farm before making the judgment.

Drinkers are not properly structured.	INSUFFICIENT
Drinkers are properly structured.	FAIR

Animals must have constant access to drinking water throughout the day and the drinkers must be in sufficient number to ensure that the water needs of all turkeys are covered, which increases 6.5% for each °C when the environmental temperature exceeds 21°C.

Since there are no specific legislative indications for the species, adequate standards have been chosen through a bibliographic survey to ensure that the number and size of drinkers are such to prevent competition during bird access to the drinkers.

Recommendations refer to moderate ambient temperature conditions.

The inspector must calculate the total number drinkers in the house according to drinker type.

For Nipples/Cups: Calculate number per meter and then multiply by total track length.

Bell drinkers/troughs: count number in the barn

Divide the total number of birds in the house by number of Drinkers.

There are no legally binding thresholds available, however in bibliography there are some indications and even more detailed indications are reported in production guidelines and private welfare assessment schemes. In general number of turkeys per feeder must be less than or equal to the maximum number specified by documents from the feeder manufacturer. Before assigning the judgment, the evaluator should consider the recommendations of the manufacturing company. Drinkers must be distributed evenly throughout the house to reduce undue competition among the birds. poults. There must be no signs that the birds are competing due to a lack of drinker space

Behaviour will change according to time of the day and drinking bouts occur mostly after eating. Therefore, the use of ABIs such as number of birds drinking may be misleading. Resource iceberg indicators could be excessively dry or wet litter.

It is advisable to count the number of drinkers inside the shed and follow the instructions in table 4 for the calculation of the minimum space of turkey troughs (cm). Where there are several types of drinking troughs with the same shed (e.g. Cups and bells), the assessor will have to calculate the maximum number of turkeys for all the available cups, subtract them from the number of turkeys present and calculate the cm of feeder necessary for the number of turkeys left.

Table 4. Minimum drinker space for turkey (cm)¹ (from Federation of Animal Science Societies 2010 amended).

Age (weeks)	Type of drinking trough		
	Linear	Bell shape	Per cup
Females			
0-16,5	1,27	1,02	10
Male			
0-8	1,27	1,02	20
8-16	1,91	1,53	10
16-20	2,54	2,03	10

¹ The minimum spaces required for drinking troughs is calculated as linear trough space for turkey. If only on side of drinking trough is available, the necessary space indicated must be doubled.



Picture 19. Example of a circular drinking trough.

27. Administration of illegal substances

"No other substance, with the exception of those given for therapeutic, or prophylactic purposes or for the purposes of zootechnical treatment as defined in Article 1(2)(c) of Directive 96/22/EEC (1), must be administered to an animal unless it has been demonstrated by scientific studies of animal welfare or established experience that the effect of that substance is not detrimental to the health or welfare of the animal." (Directive 98/58 CE, Annex, Paragraph 18).

"Except as provided for in Articles 4 and 5, it shall be prohibited for thyrostats, stilbenes and stilbene derivatives and their salts and esters, estradiol-17 beta and its derivatives in the form of esters and beta-agonists and for substances having an estrogenic action – other than estradiol – 17 beta and its derivatives in the form of esters – androgenic or gestagenous:

- a) administration [...];*
- b) the keeping on a holding, [...] and the placing on the market or slaughter for human consumption of farm animals containing substances referred to in this subparagraph [...];*
- d) the placing on the market of the meat of the animals referred to in point b);*
- e) the processing of the meat referred to in point d) or the subsequent placing on the market."*

Item 27

ADMINISTRATION OF ILLEGAL SUBSTANCES

(Category of assessment: Feed, water and other substances)

"No other substance, with the exception of those given for therapeutic, or prophylactic purposes or for the purposes of zootechnical treatment as defined in Article 1(2)(c) of Directive 96/22/EEC (1), must be administered to an animal unless it has been demonstrated by scientific studies of animal welfare or established experience that the effect of that substance is not detrimental to the health or welfare of the animal"

Check the electronic treatment log or records and medication cabinet.

Administration of not allowed substances.	INSUFFICIENT
No administration of not allowed substances.	FAIR

The administration of prohibited pharmacologically active substances (substances with a hormonal, thyrostatic and beta-agonist action) potentially dangerous both for animal and human health, could constitute an illicit treatment.

VIII Mutilation

28. Mutilation and other practices

"Pending the adoption of specific provisions concerning mutilations in accordance with the procedure laid down in Article 5, and without prejudice to Directive 91/630/EEC, relevant national provisions shall apply in accordance with the general rules of the Treaty." (Directive 98/58/EC, Annex, point 19).

Item 28

MUTILATION AND OTHER PRACTICES

(Category of assessment: Mutilations)

"Pending the adoption of specific provisions concerning mutilations in accordance with the procedure laid down in Article 5, and without prejudice to Directive 91/630/EEC, relevant national provisions shall apply in accordance with the general rules of the Treaty."

Mutilation is defined as a practice not carried out for therapeutic or diagnostic purposes, which is manifested as damage to or loss of a sensitive body part or alteration of bone structure. Check for animals with mutilations (e.g., beak truncation, castration). If these are performed and can be traced back to the period of the animal's stay on the farm inspected, the treatment record (paper or electronic) should be checked to see if anaesthetic and analgesic treatment was performed/prescribed by the veterinarian at the same time. All treatments, which involve gory operations, must be performed with sterile or disposable materials and carried out in such a way as to avoid prolonged or unnecessary pain or suffering to the animal. The absence of any mutilation and/or castration on all animals is considered optimal.

Presence of animals with mutilations that do not meet regulatory requirements.	INSUFFICIENT
Presence of animals with mutilations that meet regulatory requirements.	FAIR
All animals are intact and have no mutilations.	OPTIMAL

Annex 1 point 19 of Directive 98/58/EC, entrusts each Member State to set proper national provisions as regards to mutilations. Mutilations performed in turkeys in different member states are described in a report of EURCAWSFA (2023-DL.3.1.2: Description of the main husbandry systems used for turkey farming in Europe). The inspector must verify that no mutilation of turkeys has been performed breaching national legislation provisions.

IX Breeding procedures

29. General provisions

2. "Obligations of owners, janitors of animal keepers"

"The owner or janitor or keeper shall:

Take appropriate measures to ensure the welfare of his or her animals and that no unnecessary pain, suffering or injury is caused to them;

Breed and keep animals [omissis] in accordance with the provisions set forth in the Annex."
(Directive 98/58/EC, Art.2, Paragraph 1)

"Natural or artificial breeding or breeding procedures that cause or are likely to cause the animals in question suffering or injury shall not be practiced. This provision does not prevent the use of certain procedures that may cause minimal or momentary suffering or injury or require interventions that do not cause lasting injury, if permitted by national provisions." (Directive 98/58/EC, Annex, Breeding Procedures, item 20).

Item 29

GENERAL PROVISIONS

(Category of assessment: Breeding procedures)

2. "Obligations for owners and animal keepers"

"The owner or keeper shall:

Take appropriate measures to ensure the welfare of his or her animals and that no unnecessary pain, suffering or injury is caused to them;

Breed and keep animals [omissis] in accordance with the provisions set forth in the Annex."

"Natural or artificial breeding or breeding procedures that cause or are likely to cause the animals in question suffering or injury shall not be practiced. This provision does not prevent the use of certain procedures that may cause minimal or momentary suffering or injury or require interventions that do not cause lasting injury, if permitted by national provisions."

Assess whether breeding procedures are being practiced that are contrary to one or more of the 5 freedoms, such as to cause negative evidence on the status of the animals.

Breeding not appropriate for the assessed species with obvious limitations at the 5 freedoms level.	INSUFFICIENT
Breeding consonant with the species evaluated without restriction of the 5 freedoms.	FAIR

X ABM

30. Average weekly mortality

"Mortality, culling and, if possible, morbidity levels should be closely monitored and post-mortem examination performed as needed. Records of all these results must be kept" (EC 2001, Article 7 point 3).

Item 30	
AVERAGE WEEKLY MORTALITY	
<p>"Mortality, culling and, if possible, morbidity levels should be closely monitored, and post-mortem examination performed as needed. Records of all these results must be kept" (EC 2001, Article 7 point 3). Average weekly mortality is obtained by summing weekly mortalities divided by the number of weeks since housing. Weekly mortality is defined as the number of deaths (including culls) recorded over a week, divided by the number of animals present on the previous seventh day, expressed as a percentage. The figure can be provided by the farmer as it can be deduced from the daily mortality tables of each individual shed and will be considered acceptable if the mortality percentage is between 0.5 and 0.6 percent; while it will be considered positive if it is less than 0.5 percent. If the farmer does not record the data for each individual shed, but in cumulative form for the whole herd, the rating will be insufficient.</p> <p style="text-align: center;">The limits given are only an aid to the evaluator who will still have to consider all the risk factors of the herd before making the judgment.</p>	
% average weekly mortality > 0,6%.	INSUFFICIENT
% average weekly mortality between 0,5% and 0,6%.	FAIR
% average weekly mortality < 0,5%.	OPTIMAL

Normative references

- Commission Decision of 14 November 2006 on the minimum requirements for the collection of information during inspections carried out at production sites where certain species of animals are reared. Official Journal of the European Union L314/39.
- Directive 92/102/CEE on the identification and registration of animals”.
- Directive 98/58/CE on the protection of animals kept for farming purposes.
- Directive 2003/74/CE, concerning the prohibition of the use of certain substances with a hormonal, thyrostatic and beta-agonist action in animal production”.
- Directive 2004/28/CE on the Community code of veterinary medicinal products.
- Directive 98/83/CE on the quality of water intended for human consumption.
- Council Directive 96/22/CE of 29 April 1996, prohibiting the use of certain substances having a hormonal or thyrostatic action and beta-agonists in livestock production and repealing Directives 81/602/CEE, 88/146/CEE and 88/299/CEE, published in Official Journal n. L 125 of 23 May 1996.
- Council Regulation (EC) n. 1099/2009, of 24 September 2009, on the protection of animals at the time of killing durance. O.J. L 303, 18.11.2009, p. 1–30
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About EURCAW-Poultry-SFA

EURCAW-Poultry-SFA is one of the four European Union Reference Centres for Animal Welfare. It focuses on poultry and other small farmed animals welfare and legislation, and covers the entire life cycle from hatch/birth to the end of life. EURCAW-Poultry-SFA's main objective is to scientifically and technically support the European Commission and Member States for implementation of welfare legislation. This includes:

- Directive 98/58/EC concerning the protection of animals kept on farms;
- Regulations 1/2005/EC and 1099/2009/EC concerning their protection during transport and slaughter;
- Directive 1999/74/EC laying down minimum standards for the protection of laying hens;
- Directive 2007/43/EC laying down minimum rules for the protection of chickens kept for meat production.

Partners

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- ANSES, France
- IRTA, Spain
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Activities of EURCAW-Poultry-SFA

- Coordinated Assistance
Providing support, networking and Questions to EURCAW;
- Welfare indicators, Assessment & Good Practices
Identifying animal welfare indicators, including animal based, management based and resource-based indicators, that can be used to verify compliance with the EU legislation;
- Scientific and technical studies
Preparing Scientific Reviews of knowledge on welfare topics, identify research needs and perform scientific and technical studies to fill the gaps of knowledge;
- Training
Reviewing existing training activities and developing new training materials, webinars and knowledge pills for official inspectors and competent authorities;
- Communication and Dissemination
Increasing awareness of our outputs via the website, and newsletter.

Website and contact

EURCAW-Poultry-SFA's website offers relevant and actual information to support enforcement of poultry and other small farmed animals' welfare legislation.

We offer a 'Questions to EURCAW' service for official inspectors, policy workers, and other personnel providing advice or support for official controls of poultry and other small farmed animals welfare in the EU. For more information go to the Q2E webform available online [here](#) or <https://survey.anses.fr/SurveyServer/s/DSL/Queryw>. All Q2E answers are available [online](#).