# 2023-DL.3.2.1-REFINED DRAFT GUIDELINES BASED ON INDICATORS IDENTIFIED IN ACTIVITY 2 AND FEEDBACK ON ITS APPLICATION ON FIELD IN TEN LAYING HEN FARMS

# Summary

# 1. Definitions

**Item:** A welfare requisite to assess, included in the Classyfarm system, which can be:

- **Legal requirement:** a requisite of the EU legislation to be assessed during the official controls. Example: Directive 98/58 EC, Annex, Paragraph 10: "Temperature, relative air humidity […] must be kept within limits which are not harmful to the animals"
- **Additional requirement:** Conditions that are not legally mandatory but supported by literature in improving the welfare of farmed animals. Example: maintenance of drinkers, litter quality, environmental enrichments.

**Indicator**: an indicator is an occurrence, observation, record or measurement which has a proven relationship with the requirement (legal requirements and others) which can be:

- **Iceberg indicator:** indicator reflecting major welfare issues in an integrative manner in order to enable an initial overview of the welfare state.

- **Animal-based indicator (ABI)**: a response of an animal or an effect on an animal used to assess its welfare. It can be taken directly on the animal or indirectly and includes the use of animal records. Example: huddling as ABI of cold stress and panting as ABI of heat stress.

- **Resource-based indicator (RBI):** an evaluation of a feature of the environment in which the animal is kept or to which it is exposed. Example: environmental temperature, humidity.

- **Management-based indicator (MBI):** an evaluation of what the animal unit manager or stockperson does, and which management processes or tools are used. Example: protocol for activation of the ventilation system (*EURCAW-Poultry-SFA, 2020*).

**Method for the assessment (= method):** a form of evaluation of the indicators that might be used in the frame of the verification of the requirements (legal requirements and others). Example: examine groups of birds at up to 5 well-distributed locations. If birds are panting, count out 100 birds (do not disturb them and leave them sitting where they are) and estimate how many of the 100 birds are panting.

**Classyfarm platform:** Italian national platform able to categorize, through an algorithm, the animal welfare risk level of farms.

# 2. Introduction

In 2018, the Italian Ministry of Health commissioned the Istituto Zooprofilattico Sperimentale della Lombardia e dell'Emilia Romagna (IZSLER) to develop a national platform, named Classyfarm, that categorizes, through a scoring system, the risk arising from farm animal welfare in the context of veterinary public health inspections. The sections of interest are six: animal welfare, biosecurity, health parameters, animal nutrition, antimicrobial consumption and lesions detected at slaughterhouse.

Animal welfare sections have been developed for most of the farmed animal species and for different rearing systems aimed not only at supporting official controls on implementation of animal welfare legislation, but also to collect farms data at national level. For this, checklists and guidelines for their correct usage were drafted.

In laying hens, checklist and guidelines were developed in 2021, taking into consideration the legal requirements of Council Directive 98/58/EC of 20 July 1998 concerning the protection of animals kept form farming purposes and Council Directive 1999/74/EC of 19 July 1999 laying down minimum standards for the protection of laying hens and how to check compliance of the legal requirements through indicators and methods reported by *EURCAW-Poultry-SFA (2020a, 2020b)*. The same year, focusing on animal welfare, an Expert Knowledge Elicitation (EKE) was organized to collect the opinion of ten Italian poultry veterinarians from different working environments (Istituti Zooprofilattici, Universities, official veterinarians and private practitioners). The experts were asked to rate the relevance of the items included in the checklist in terms of their impact on laying hen's welfare and the certainty of their judgement in order to weight the items.

The checklist on the welfare of the laying hens foresees the assessment of a total of 61 items, 53 items are legal requirements while 8 are additional requirements. The items are classified in different risk areas:

- Area A – "Management"; This area includes the assessment of items through MBIs.
- Area B – "Equipment and facilities". This area includes the assessment of items through RBIs which the corresponding non-compliance category can be reported.
- Area C – "Animal – based measures" This area includes the assessment of items through ABIs.
- Area "Major risks and alarm systems" This area considers certain environmental factors that in the event of a major hazard situation, could make a difference in safeguarding health and welfare of the animals (e.g. item 55 – Alarm system, ANNEX I).

Relevance was scored in a 6-point scoring scale (from 0 being “negligible impact on welfare” to 5 being “very high impact on welfare”) while the certainty of the judgement was scored in a 3-point scale (from 1 “low certainty” to 3 “high certainty”).

Outcomes of EKE were used to ‘weigh’ the different items, so that a score was assigned to each item according to its potential impact on animal welfare and the checklist was structured in order to mark one of the two or three possible answers for each Item assessed being:

- Insufficient where minimum requirements are not met
- Acceptable where minimum requirements are fulfilled
- Optimal where it is possible to highlight welfare conditions exceeding minimum requirements.

The Classyfarm tool can be filled directly on farm via mobile/browser application, thus avoiding the use of paper sheets. All data are then directly transferred to the Classyfarm platform, which automatically processes data and generate a PDF document (report) showing the percentage score obtained for each Area and the total welfare score of the farm, reflecting the risk in terms of animal welfare, such as evaluated by this system. The dedicated platform algorithm elaborates the data collected on farm, to provide a percentage corresponding to the risk level related to animal welfare where 0 indicates a high welfare risk and 100 indicates a low welfare risk. Specifically, the thresholds of the total welfare score are as follows: a score up to 59% is to be considered as poor, from 60 to 80% medium and above 80% good. Contributions to the total welfare score come from 25% final score in Area A, 25% final score in Area B and 50% final score in Area C as reported in *Ginestreti et al., (2020)*. In this sense, outcomes of ABIs have a greater impact on the total welfare score than RBIs and MBIs. The “Major risks and alarm systems” area score is separated from the total welfare score.

The output of Classyfarm is represented through interactive dashboards. These, provide results on welfare scores at both individual (single farm) and aggregated level (national, regional or local group of farms), giving users an overview and the opportunity to compare their farm’s welfare scores with the national and regional or local average ones. However, for laying hens it has not been used in practice yet and for this reason the present deliverable is aimed at testing for the first time the laying hens checklist, to assess the feasibility of the welfare assessment on farm so that it could be refined and proposed. The guidance will then be available to anyone who wish to evaluate welfare at farm level, including official services of all EU Member States. The efficiency of the platform will be also tested.

# 3. Methodology

## 3.1 Preliminary work

In order to perform visits to laying hen farms, it was necessary to carry out some preliminary work. First, checklist and guidelines text were translated into English language, so that it could be shared with EU Member States. Subsequently, the Italian checklist had to be entered into the Classyfarm platform. To do this, it was necessary to manually enter the title, description and answers of each item on the checklist in "create new questionnaire template" Classyfarm section. For each possible answer, the score resulting from the EKE was entered: this procedure results essential, as it allows the platform to calculate the welfare scores. The same work was carried out with the translated checklist, with the aim of obtaining evaluation outputs in English language.

## 3.2 Inspections to laying hen farms

With the aim of testing the Classyfarm checklist on laying hens, ten farm visits were conducted:

- Six in aviaries with multitier systems
- Four in enriched cages systems

These have been carried out, always by the same two people, in Italy between November 2022 and January 2023, specifically in the Lombardy region (Brescia).

### 3.2.1 List of equipment needed

Before carrying out the assessment, inspectors should be equipped with:

- Laying hen welfare checklists (one for each visited house) or tablet (if filled in directly on farm through the mobile application).
- Clean and appropriate clothing and footwear (one for each house)
- Devices for measuring environmental parameters ($CO_2$, $NH_3$, relative humidity and environmental temperature)
- A5 – A6 size sheets of black paper for measuring dust level (two for each section of the house)
- Laser distance meter and/or measuring tape
- Digital light meter

It is advisable to check that the digital equipment for measuring light and environmental parameters are calibrated according to the manufacturing instructions.

### 3.2.2 Practical information

Upon arrival, after complying with the farm biosecurity procedures, the visit begins.

The first part of the data retrieval is carried out in the office, where the following information is collected:

- farm data (housing system, number and size of house, number of animals at the time of the inspection for each house, and technical documentation regarding the housing system, *fig.1*).

- data records (e.g. animals' age, mortality, veterinary treatments, water and feed consumption, *fig.2*).

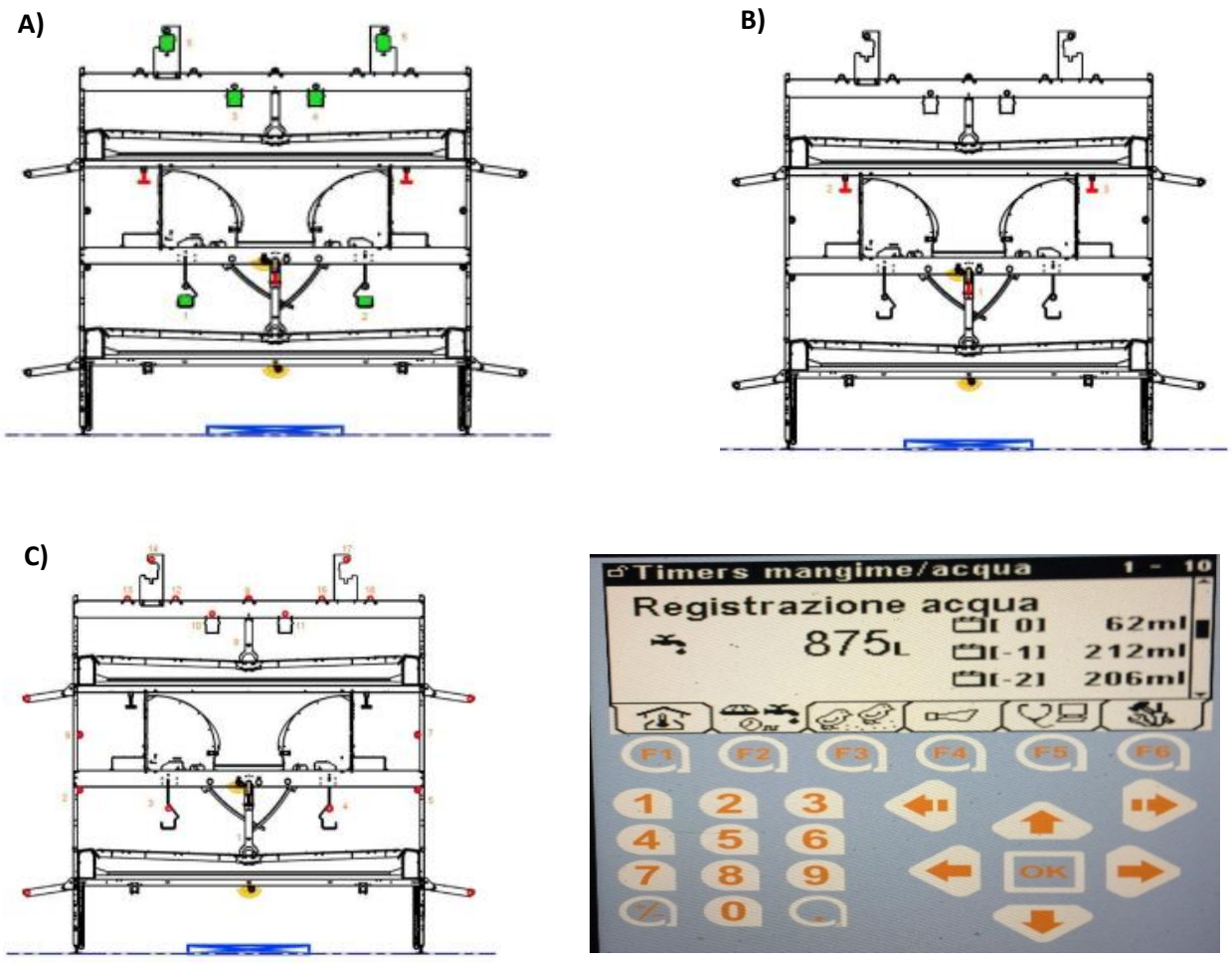



*Figure 1. Example of technical documentation (aviary system, central line section): A) feeders' position in green; B) drinkers' position in red; C) perches' position in red. Courtesy of: NuovoSole di Favagrossa e Bodini s.a.*




*Figure 1. Example of water consumption control unit (IZSLER)*

Before entering the house, the proper functioning of the control units, when present, is checked. In particular, it is required to test the functioning of:

- Control units for monitoring environmental parameters ($CO_2$, $NH_3$, relative humidity and environmental temperature)
- Control units of ventilation system *(fig.3)*
- Lighting control units (light programme and twilight period)
- Alarm system *(fig.4)*
- Power generator
- Emergency water system *(fig.5)*

This preliminary information gives a general overview of the microclimatic conditions and light levels of the houses that are then verified once inside.

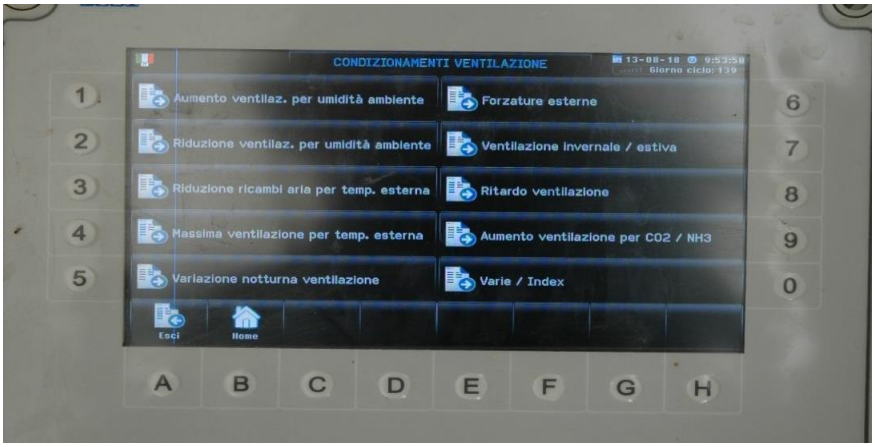



*Figure 2. Example of ventilation system control unit (IZSLER)*

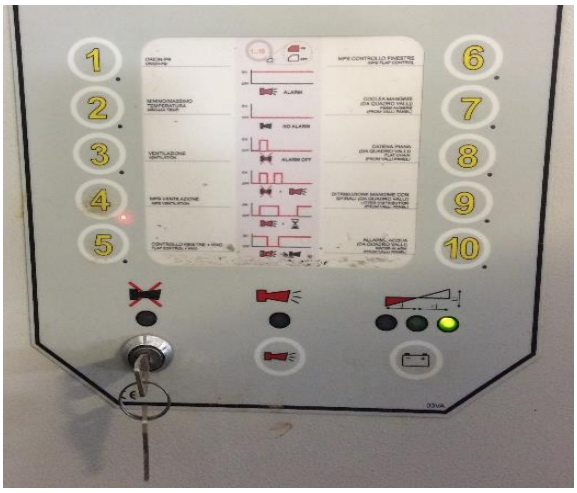


*Figure 4. Example of alarm system (IZSLER)*


*Figure 5. Example of emergency water system (IZSLER)*

### 3.2.3 Order of the visit

#### Checklist: Area A – Management

The first area of the checklist (Area A - Management) includes fourteen items (see ANNEX I) of which twelve are those assessing compliance with current European legislation (Council Directive 98/58/EC of 20 July 1998 and Council Directive 1999/74/EC of 19 July 1999) and evaluates MBIs implemented on farm, such as: number and training of employees who take care of the animals, the state of cleanliness inside the house, daily removal of dead animals and all necessary checks to ensure good feed and water supply for the birds. Two items contain additional requirements (item 12 "maintenance of drinkers" and item 14 "litter quality"). The items of this area of the checklist can be partially assessed during the interview with the farmer and subsequently confirmed with an inspection inside the house (e.g. for verifying the effective removal of dead animals, manure management and the litter quality).

#### Checklist: Area B – Equipment and facilities

The second area of the checklist (Area B – Equipment and facilities), including thirty-five items (ANNEX I) of which thirty-three are assessing the compliance with current European legislation (Council Directive 98/58/EC of 20 July 1998 and Council Directive 1999/74/EC of 19 July 1999) about the adequacy of facilities and equipment, the minimum requirements for stocking density and lighting and environmental conditions inside the house. Two items contain additional requirement (item 31 and 32 daily water and feed consumption). In this Area, checklist items are divided by housing system, therefore the specific legal requirement is described for each different system.

#### Checklist: Area C – Animal based measures

The third area of the checklist (Area C – Animal – based indicators, including two items (ANNEX I) of which one is those assessing the compliance with current European legislation (Council Directive 98/58/EC of 20 July 1998 – Item 51, Mutilations) and the other one is item 52 "weekly mortality rate", that is an additional requirement. In addition to these, the transect method was carried out to check the general state of welfare of the animals through the use of direct ABIs.

Checklist: Area – Major risks and alarm system

This area considers certain environmental factors that do not affect directly animals' welfare, but in the event of a major hazard situation (e.g. water or electrical faults) could play a key role in safeguarding the bird's health. These items are assessed at the beginning of the visit, before entering the houses.

## 4. Results

The total duration of each inspection made, was in average 90 min, of which 30 min for inspections of official documentation and central control units and 60 min for the inspections performed inside the house.

Once the data collected during the inspection is uploaded, the Classyfarm platform provides outputs consisting in reports (showing the results in detail for each individual farm assessed) and dashboards (comparing the scores of an individual farm or a group of farms, with territorial average scores on a different scale). Specifically, the average score for each risk area of the ten visits of farms carried out during 2022/2023 was: 81.1% for Area A – Management; 81.0% for Area B – Equipment and facilities, 71.9% for Area C – ABIs and 81.5% for major risks and alarm system Area. The average total welfare score Area of the ten farms inspected, calculated by the platform on the basis of the results obtained in the Area A, B and C of the Classyfarm welfare checklists of laying hens was 76.5%.

In particular, of total visits carried out, nine Items (1.5% of total Items evaluated) were scored "insufficient" by evaluators: three farms did not have an infirmary or at least an area that could be used as an infirmary when needed, five farms did not have any environmental enrichment present inside the house (additional requirement) and one farm did not have a lighting plan (lack of information regarding the twilight period adopted).

The score 'optimal' was reached 147 times (24%) out of the total items assessed. Most of the optimal answers were given to automation, alarm and monitoring systems for light and environmental parameters, which are items belonging to the major risks area.

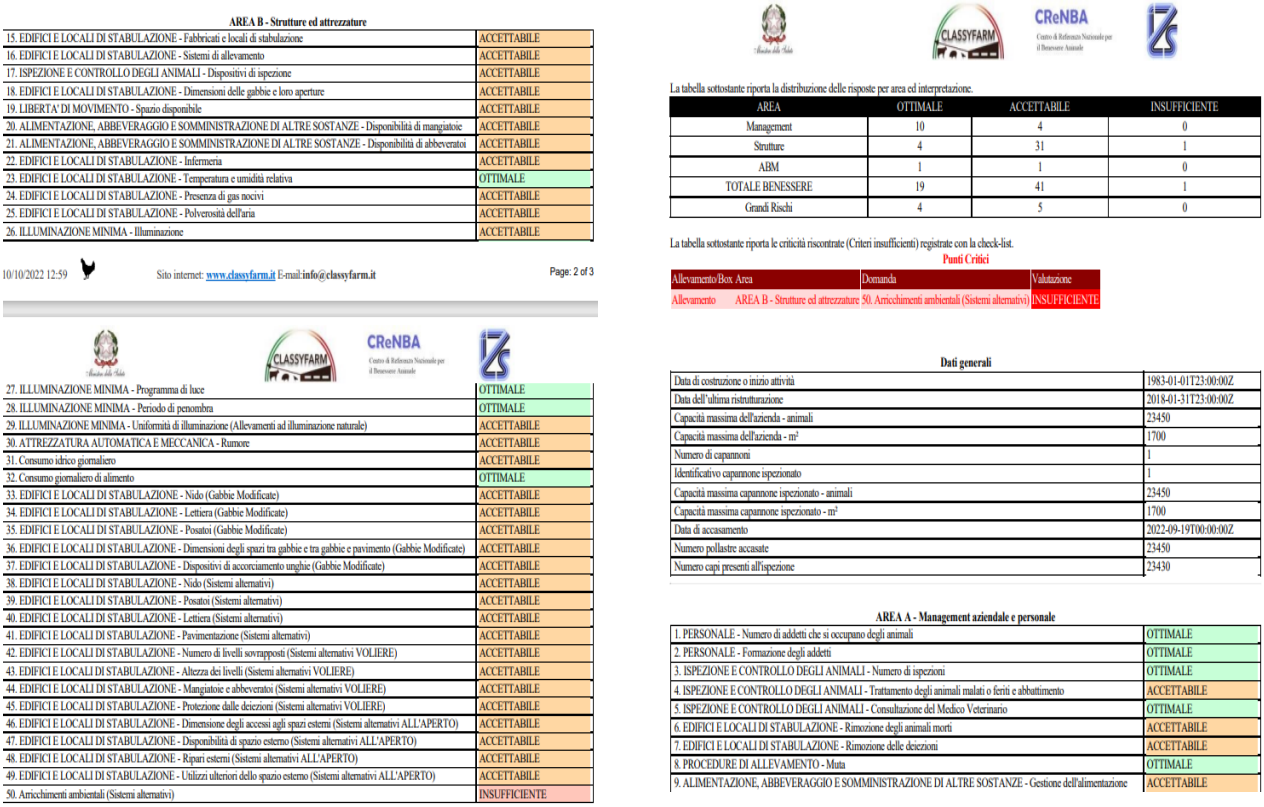
All farms inspected were given the score "acceptable" in item 51 "Mutilations". This means that all farms housed mutilated (beak trimmed) animals with a regular certificate released by the Competent Authorities. Three farms were given the acceptable score on the ABI "average weekly mortality", which attested an average weekly mortality between 0.1% and 0.2%, while seven farms were given the "optimal" score, with average weekly mortality below 0.1%.

## 4.1 Report

After the checklist's data are collected and uploaded in the platform, a PDF result report (*fig.6*) which contains the following information can be extracted:

- Farm data (e.g., owner, farm code, official inspectors)
- Welfare score: single area score/total welfare score (area A+B+C)/Major risks area score
- Critical points (legislative non-compliances)
- Item list with single assessor's answers

The final result of the evaluation system is not only to identify the main possible critical issue (legislative non-compliances), but also to identify, through a numerical index obtained from the processing of all the information, the overall level of risk of the farm. Added to this, reports summarize the partial results of each risk area, which provides an indication of the weight and importance that each of them has in the final composition of the risk index.



**AREA B - Strutture ed attrezzature**

| | |
|---|---|
| 15. EDIFICI E LOCALI DI STABULAZIONE - Fabbricati e locali di stabulazione | ACCETTABILE |
| 16. EDIFICI E LOCALI DI STABULAZIONE - Sistemi di allevamento | ACCETTABILE |
| 17. ISPEZIONE E CONTROLLO DEGLI ANIMALI - Dispositivi di ispezione | ACCETTABILE |
| 18. EDIFICI E LOCALI DI STABULAZIONE - Dimensioni delle gabbie e loro aperture | ACCETTABILE |
| 19. LIBERTA' DI MOVIMENTO - Spazio disponibile | ACCETTABILE |
| 20. ALIMENTAZIONE, ABBEVERAGGIO E SOMMINISTRAZIONE DI ALTRE SOSTANZE - Disponibilità di mangiatoie | ACCETTABILE |
| 21. ALIMENTAZIONE, ABBEVERAGGIO E SOMMINISTRAZIONE DI ALTRE SOSTANZE - Disponibilità di abbeveratoi | ACCETTABILE |
| 22. EDIFICI E LOCALI DI STABULAZIONE - Infermeria | ACCETTABILE |
| 23. EDIFICI E LOCALI DI STABULAZIONE - Temperatura e umidità relativa | OTTIMALE |
| 24. EDIFICI E LOCALI DI STABULAZIONE - Presenza di gas nocivi | ACCETTABILE |
| 25. EDIFICI E LOCALI DI STABULAZIONE - Polverosità dell'aria | ACCETTABILE |
| 26. ILLUMINAZIONE MINIMA - Illuminazione | ACCETTABILE |

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| | |
|---|---|
| 27. ILLUMINAZIONE MINIMA - Programma di luce | OTTIMALE |
| 28. ILLUMINAZIONE MINIMA - Periodo di penombra | OTTIMALE |
| 29. ILLUMINAZIONE MINIMA - Uniformità di illuminazione (Allevamenti ad illuminazione naturale) | ACCETTABILE |
| 30. ATTREZZATURA AUTOMATICA E MECCANICA - Rumore | ACCETTABILE |
| 31. Consumo idrico giornaliero | ACCETTABILE |
| 32. Consumo giornaliero di alimento | OTTIMALE |
| 33. EDIFICI E LOCALI DI STABULAZIONE - Nido (Gabbie Modificate) | ACCETTABILE |
| 34. EDIFICI E LOCALI DI STABULAZIONE - Lettiera (Gabbie Modificate) | ACCETTABILE |
| 35. EDIFICI E LOCALI DI STABULAZIONE - Posatoi (Gabbie Modificate) | ACCETTABILE |
| 36. EDIFICI E LOCALI DI STABULAZIONE - Dimensioni degli spazi tra gabbie e tra gabbie e pavimento (Gabbie Modificate) | ACCETTABILE |
| 37. EDIFICI E LOCALI DI STABULAZIONE - Dispositivi di accorciamento unghie (Gabbie Modificate) | ACCETTABILE |
| 38. EDIFICI E LOCALI DI STABULAZIONE - Nido (Sistemi alternativi) | ACCETTABILE |
| 39. EDIFICI E LOCALI DI STABULAZIONE - Posatoi (Sistemi alternativi) | ACCETTABILE |
| 40. EDIFICI E LOCALI DI STABULAZIONE - Lettiera (Sistemi alternativi) | ACCETTABILE |
| 41. EDIFICI E LOCALI DI STABULAZIONE - Pavimentazione (Sistemi alternativi) | ACCETTABILE |
| 42. EDIFICI E LOCALI DI STABULAZIONE - Numero di livelli sovrapposti (Sistemi alternativi VOLIERE) | ACCETTABILE |
| 43. EDIFICI E LOCALI DI STABULAZIONE - Altezza dei livelli (Sistemi alternativi VOLIERE) | ACCETTABILE |
| 44. EDIFICI E LOCALI DI STABULAZIONE - Mangiatoie e abbeveratoi (Sistemi alternativi VOLIERE) | ACCETTABILE |
| 45. EDIFICI E LOCALI DI STABULAZIONE - Protezione dalle deiezioni (Sistemi alternativi VOLIERE) | ACCETTABILE |
| 46. EDIFICI E LOCALI DI STABULAZIONE - Dimensione degli accessi agli spazi esterni (Sistemi alternativi ALL'APERTO) | ACCETTABILE |
| 47. EDIFICI E LOCALI DI STABULAZIONE - Disponibilità di spazio esterno (Sistemi alternativi ALL'APERTO) | ACCETTABILE |
| 48. EDIFICI E LOCALI DI STABULAZIONE - Ripari esterni (Sistemi alternativi ALL'APERTO) | ACCETTABILE |
| 49. EDIFICI E LOCALI DI STABULAZIONE - Utilizzi ulteriori dello spazio esterno (Sistemi alternativi ALL'APERTO) | ACCETTABILE |
| 50. Arricchimenti ambientali (Sistemi alternativi) | INSUFFICIENTE |

La tabella sottostante riporta la distribuzione delle risposte per area ed interpretazione.

| AREA | OTTIMALE | ACCETTABILE | INSUFFICIENTE |
|---|---|---|---|
| Management | 10 | 4 | 0 |
| Strutture | 4 | 31 | 1 |
| ABM | 1 | 1 | 0 |
| TOTALE BENESSERE | 19 | 41 | 1 |
| Grandi Rischi | 4 | 5 | 0 |

La tabella sottostante riporta le criticità riscontrate (Criteri insufficienti) registrate con la check-list.

Punti Critici

| Allevamento/Box Area | Domanda | Valutazione |
|---|---|---|
| Allevamento | AREA B - Strutture ed attrezzature 50. Arricchimenti ambientali (Sistemi alternativi) | INSUFFICIENTE |

**Dati generali**

| | |
|---|---|
| Data di costruzione o inizio attività | 1983-01-01T23:00:00Z |
| Data dell'ultima ristrutturazione | 2018-01-31T23:00:00Z |
| Capacità massima dell'azienda - animali | 23450 |
| Capacità massima dell'azienda - m² | 1700 |
| Numero di capannoni | 1 |
| Identificativo capannone ispezionato | 1 |
| Capacità massima capannone ispezionato - animali | 23450 |
| Capacità massima capannone ispezionato - m² | 1700 |
| Data di accasamento | 2022-09-19T00:00:00Z |
| Numero pollastre accasate | 23450 |
| Numero capi presenti all'ispezione | 23430 |

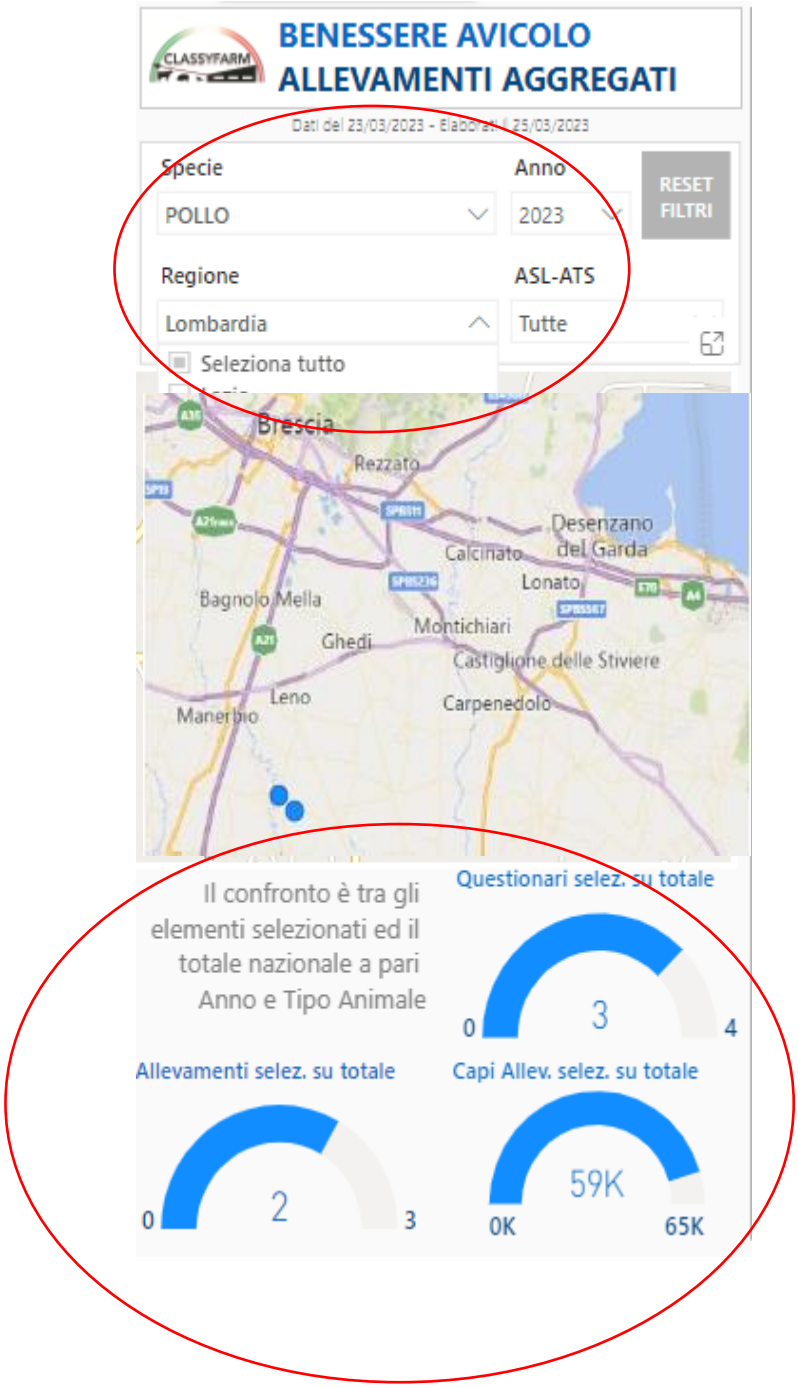
**AREA A - Management aziendale e personale**

| | |
|---|---|
| 1. PERSONALE - Numero di addetti che si occupano degli animali | OTTIMALE |
| 2. PERSONALE - Formazione degli addetti | OTTIMALE |
| 3. ISPEZIONE E CONTROLLO DEGLI ANIMALI - Numero di ispezioni | OTTIMALE |
| 4. ISPEZIONE E CONTROLLO DEGLI ANIMALI - Trattamento degli animali malati o feriti e abbattimento | ACCETTABILE |
| 5. ISPEZIONE E CONTROLLO DEGLI ANIMALI - Consultazione del Medico Veterinario | OTTIMALE |
| 6. EDIFICI E LOCALI DI STABULAZIONE - Rimozione degli animali morti | ACCETTABILE |
| 7. EDIFICI E LOCALI DI STABULAZIONE - Rimozione delle deiezioni | ACCETTABILE |
| 8. PROCEDURE DI ALLEVAMENTO - Muta | OTTIMALE |
| 9. ALIMENTAZIONE, ABBEVERAGGIO E SOMMINISTRAZIONE DI ALTRE SOSTANZE - Gestione dell'alimentazione | ACCETTABILE |

*Figure 6. Example of Classyfarm report (Font: Vetinfo, Classyfarm section). Reports from the platform have not yet been translated in English. This part will be developed later.*

## 4.2. Dashboards

The data output is shown through interactive dashboards (see *fig.7* and *fig.8*), that provide results on welfare scores at both individual (single farm) and aggregated level (national, regional or local group of farms), giving users an overview of the farm's welfare and the opportunity to compare welfare scores with the national and regional average scores.




Dashboard for aggregated area offers the possibility to view welfare assessment data, based on: species (target population), year of assessment and national, regional or local level. The map better explains farm location national field.

These graphs give an overview (based on the selection filters applied above) on:

1. Number of welfare assessments carried out;
2. Number of farms assessed for animal welfare (AW) at least once (one farm may have multiple assessments);
3. Number of animals inspected.

This information is shown compared to the respective total data, available in the dataset.

*Figure 7. Classyfarm aggregated dashboards for laying hens welfare (Font: Vetinfo, Classyfarm section).*

In relation to overall AW score, comparison among average score obtained by selected farms and average national score is given.

In relation to the scores of the 3 risk areas, composing the checklist, comparison among average welfare score obtained by selected farms and average national score is given.

Trends in AW scores are given, along with comparison with the national situation over the years.


Pie chart with the distribution (in %) of the type of answer (insufficient, acceptable and optimal) of the whole AW assessment, referring to the selected farms.

Single items of inspection are listed and their answers (insufficient, acceptable, and optimal) are given, referring to the selected farms.

*Figure 8. Classyfarm aggregated dashboards for laying hens welfare (Font: Vetinfo, Classyfarm section). Dashboards are not yet in English; this step will be performed in the future.*

These dashboards, also called "aggregates," allow the score obtained by an extended group of farms to be compared with the national average score. Other dashboards, called "individual", allow a single farm to be compared with national, regional or local average score.

## 5. Discussion

The welfare checklist for laying hens that was evaluated appears to be well structured and easy to follow during the field visit and they were all filled out directly on farm, via the app.

Items regarding lighting parameters (items 26-29) can be difficult to assess, especially if digital light meter is not available and/or the farm does not have lighting control units for managing light period and light intensity. Therefore, it is recommended to use a calibrated digital light meter and measure different zones that are representative of the light distribution of the entire house, preferring feeding and drinking zones and avoiding resting zones. Also, in the case of length or surface measurements (e.g. measuring a feeder) it is recommended to use laser distance meter as they allow easier, faster and more accurate measure.

Although some ABIs have been suggested by the Centre *EURCAW-Poultry-SFA (2020a, 2020b)* and *Welfare Quality protocol for laying hens (2019)*, only two are currently included in the Classyfarm animal welfare checklist (mutilations and average weekly mortality) that was tested here. In fact, the checklist only focuses on a single iceberg indicator such as the average weekly mortality and collect data from indicators that are easier to assess, in order to obtain large databases of information throughout the Country. There is then a necessity to integrate in the present checklist some direct ABIs that can be effective for a more complete evaluation of bird's welfare on farm.

As far as farmed poultry are concerned, assessing ABIs in large numbers of animals during field visit might be time consuming, as several indicators would require handling (and thus specific training by the assessor) and more time for the evaluations. On the other hand, ABIs are a direct reflect of the welfare of the animals. The difficult epidemiological situation related to the spread of the Avian Influenza did not allow us to evaluate additional ABIs measured through birds handling, in scenarios where a more detailed welfare assessment is needed due to the welfare impairment due to the diseases. Therefore, what can be recommended is the use of the aviary transect method, to assess several welfare indicators (e.g. feather loss) without handling birds. This method helps to get a picture of the health and welfare status of the birds at the time of the visit, as described in *EURCAW-Poultry-SFA, (2021)*. In this sense, the addition of more ABIs assessed during transect walk will certainly help to better evaluate the welfare status of the birds.

The checklist tested allow to collect feasible items in a reasonable timing (1h 30 min on average). The outputs are helpful to quantify and compare the welfare level of a farm or a group of farm vs the rest of the population. Reports are clear and the interactive dashboards were found to be user-friendly. Increasing the number of assessments form different areas of the country, will offer interesting indications into what are the major welfare risks on laying hen farms at various levels (local, regional or national) during a defined period. Although the checklist (ANNEX I) and guidelines for their usage (ANNEX II) have been fully translated from Italian language, reports and dashboards will certainly have to be made available in English language in the future, so that they can be shared with other Member States.

## 6. Conclusions

The welfare assessment of laying hens can be carried out on-farm by using the provided checklist, which includes both MBIs and RBIs and ABIs.

Currently, the Classyfarm checklist for the welfare assessment of laying hens includes only two ABIs to be assessed on farm and further studies are needed to identify other indicators to weigh the potential hazards for laying hen's health and welfare. As already described by *EURCAW – Poultry SFA, (2021)* the transect method is useful for determining different ABIs without handling the birds. Therefore, it is likely that more ABIs should be included into the Classyfarm welfare checklist in the future, to have a more valid assessment of the welfare of the birds. These could be assessed using the aviary transect method, which will be described in detail in the guidelines accompanying the checklist.

The system described in this document provides an example of a framework that can be used for different purposes:

- official inspections
- comparison between farms in terms of animal welfare risk. In addition, this information could be useful to appropriately target preventive interventions on the main factors of farms' weakness, thus improving the living conditions of the animals.

These data will be important to improve animal welfare and safeguard the agri-food sector in a sustainable way, in line with the European Farm to Fork Strategy.

Moreover, the use of a single monitoring system through European countries could help getting a picture of welfare trends in Europe, thus better defining what has improved and especially what still needs to be improved.

# 7. References


- *EURCAW – Poultry – SFA, (2020a). 2.1.1 – List of the relevant indicators for the assessment of the welfare of laying hens in alternative rearing systems. Zenodo. https://doi.org/10.5281/zenodo.7436924*
- *EURCAW – Poultry – SFA, (2020b). 2.1.2 – Description of the considered validated indicators among the identified ones and associated methodology, Laying hens welfare in alternative housing systems. Zenodo. https://doi.org/10.5281/zenodo.7436995*
- *EURCAW – Poultry – SFA, (2021). 2.2.1 – Severe Feather pecking. Zenodo. https://doi.org/10.5281/zenodo.7373072*
- *Ginestreti J., Lorenzi, V., Fusi, F., Ferrara, G., Scali, F., Alborali, G.L., Bolzoni, L., Bertocchi, L. (2020). Antimicrobial usage, animal welfare and biosecurity in 16 dairy farms in Lombardy. Large Animal Review; 26: 3-11.*
- *Welfare Quality Network (2019). Welfare Quality assessment protocol for laying hens Version 2.0. Welfare Quality Network*

FARM _____

ADDRESS _____

ASSESSOR _____

DATE _____

FARM CODE _____

GENERAL COUNSEL _____

OWNER OF THE ANIMALS _____

KEEPER _____

Date of construction _____ Date of last renovation _____

System of rearing

| | |
|---|---|
| Enriched cages (3) | |
| Alternative systems (2) | |
| Free range (1) | |
| Organic (0) | |

Veterinarian _____

Maximum farm capacity _____ (animals)

_____ ($m^2$)

Housing date _____

Number of houses _____

Number of pullets housed _____

Inspected house ID _____

Number of animals at the inspection _____

Inspected house capacity _____ (animals)

_____ ($m^2$)

Breed _____

| AREA | A | MANAGEMENT |
|---|---|---|

| Item | 1 | Staffing | Directive 98/58/EC, Annex, Paragraph 1 |
|---|---|---|---|

*"Animals shall be cared for by a sufficient number of staff"*

**The suggested thresholds only represents a suggestion for the assessor, who should always consider every risk factor before expressing the evaluation**

| | |
|---|---|
| Inadequate number of staff:<br>ALTERNATIVE SYSTEMS: approximately one person for more than 35.000 animals<br>ENRICHED CAGES: approximately one person for more than 50.000 animals | |
| Adequate number of staff:<br>ALTERNATIVE SYSTEMS: approximately one person for 15.000 - 35.000 animals<br>ENRICHED CAGES: approximately one person for 30.000 - 50.000 animals | |
| Optimal number of staff::<br>ALTERNATIVE SYSTEMS: approximately one person for less than 15.000 animals<br>ENRICHED CAGES: approximately one person for less than 30.000 animals | |

| Item | 2 | Staffing - Training | Directive 98/58/EC, Annex, Paragraph 1 |
|---|---|---|---|

*"Staff members possess the appropriate ability, knowledge*

**Staff members who attend, catch and load the birds received istructions and guidelines about Animal Welfare legislation, including protection at the time of killing under the provisions of Council Regulation (EC) 1099/2009.**

| | |
|---|---|
| Staff members did not received istructions and guidelines about animal welfare | |
| Staff members received istructions and guidelines about animal welfare | |
| Staff members took specific courses in animal welfare training | |

| Item | 3 | Number of inspections | Directive 1999/74/EC , Annex, Paragraph 1 - Directive 98/58/EC, Annex, Paragraph 2 |
|---|---|---|---|

*"All hens must be inspected by the owner or the person responsible for the hens at least once a day"*

| | |
|---|---|
| Less than 1 inspection/day | |
| 1 ore more inspections/day | |
| 2 or more inspections/day and written/informatic records of welfare problems encountered | |

| Item | 4 | Management of injured or ill animals | Directive 98/58/EC, Annex, Paragraph 4 - Reg (EC) 1099/2009 Preamble 12 |
|---|---|---|---|

*"Any animal which appears to be ill or injured must be cared for appropriately without delay"*
*"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."*

**Injured or ill hens which are in severe pain shall be given appropriate veterinary treatment or are killed without delay**

| | |
|---|---|
| Presence of ill or injured animals poorly managed | |
| Presence of ill or injured animals well managed | |

| Item | 5 | Veterinary advice | Directive 98/58/EC, Annex, Paragraph 4 |
|---|---|---|---|

*"Where an animal does not respond to such care, veterinary advice must be obtained as soon as possible."*

**In poultry farming this legal reference must be intended as a group and not individual health issue**

| | |
|---|---|
| A veterinary advice is not requested even if necessary | |
| A veterinary advice is requested if necessary | |
| Routine monitoring of the health status of the reared groups by a farm veterinarian is foreseen, even in the absence of specific ongoing problems | |

| Item | 6 | Dead animals removal | Directive 1999/74/EC , Annex, Paragraph 4 |
|---|---|---|---|

*“Dead hens must be removed every day”*

| | |
|---|---|
| Dead hens are not removed every day | |
| Dead hens are removed every day | |

| Item | 7 | Manure management | Directive 1999/74/EC , Annex, Paragraph 4 |
|---|---|---|---|

*“Droppings must be removed as often as necessary”*

**Before making the judgement , the assessor should consider equipment and facilities inside the shed (litter,belts, scrapers) and environmental conditions at the time of the evaluation (smell of ammonia, wet litter, etc.)**

| | |
|---|---|
| Droppings are not removed as often as necessary | |
| Droppings are removed as often as necessary / Deep litter | |

| Item | 8 | Breeding procedures | Directive 98/58 CE, Annex, Paragraphs 20 and 21 |
|---|---|---|---|

*"Natural or artificial breeding or breeding procedures which cause or are likely to cause suffering or injury to any of the animals concerned must not be practised. This provision shall not preclude the use of certain procedures likely to cause minimal or momentary suffering or injury, or which might necessitate interventions which would not cause lasting injury, where these are allowed by national provisions."*
*"No animal shall be kept for farming purposes unless it can reasonably be expected, on the basis of its genotype or phenotype, that it can be kept without detrimental effect on its health or welfare."*

| | |
|---|---|
| Forced moulting is practised or unforced moulting is not performed in accordance with legislation | |
| Slow or unforced moulting is practised in accordance with legislation | |
| Moulting is not practised | |

| Item | 9 | Feeding management | Directive 98/58/EC, Annex, Paragraph 14 |
|---|---|---|---|

*"Animals must be fed a wholesome diet which is appropriate to their age and species and which is fed to them in sufficient quantity to maintain them in good health and satisfy their nutritional needs"*

| | |
|---|---|
| Diet is not appropriate to animals'needs and/or it is not made up of wholesome food | |
| Diet is appropriate to animals'needs and it is made up of wholesome food | |

| Item | 10 | Type of feeding | Directive 98/58/EC, Annex, Paragraph 15 |
|---|---|---|---|

*"All animals must have access to feed at intervals appropriate to their physiological needs"*

**The suggested thresholds only represents a suggestion for the assessor, who should always consider every risk factor before expressing the evaluation**

| | |
|---|---|
| Inadequate access to food: the feed is not guaranteed in 24 hours and/or is distributed at intervals inappropriate to animals' physiological needs | |
| Adequate access to food: the feed is guaranteed in 24 hours and it is distributed at intervals appropriate to animals' physiological needs | |
| Ad libitum feeding | |

| Item | 11 | Water quality | Directive 98/58/EC, Annex, Paragraph 16 |
|---|---|---|---|

*"All animals must have access to a suitable water supply or be able to satisfy their fluid intake needs by other means."*

**Water quality must be evaluated. For the water amount assessment, check at "Drinkers'availability" item.**

| | |
|---|---|
| Well or surface water not properly treated or analytically tested | |
| Well or surface water subjected to appropriate treatment or analytical control | |
| Aqueduct water or well or surface water subjected to at least one microbiological and chemical control yearly and evidence and adequacy of a SOP regarding water quality management | |

| Elemento di verifica | 12 | Maintenance of drinkers | |
|---|---|---|---|

**To prevent the deterioration of environmental conditions, drinkers must be organised and maintained in order to minimise losses. Moreover they must be suitably placed, adapted to the age of the animals.**

| | |
|---|---|
| Drinkers that lose water and/or clogged and/or badly located | |
| Drinkers that are not losing water, not clogged, well located | |
| Drinkers that are not losing water, not clogged, well located and evidence of POS related to drinkers' management | |

| Item | 13 | State of cleanliness | Directive 1999/74/EC , Annex, Paragraph 4 |
|---|---|---|---|

*"While the cages are occupied, the surfaces and all equipment shall be kept satisfactorily clean"*

**The assessor must evaluate the fully house cleanliness condition, including equipment and facilities (feeders, drinkers, perches, nests..)**

| | |
|---|---|
| The surfaces and all equipment are not satisfactorily clean | |
| The surfaces and all equipment are satisfactorily clean | |
| The surfaces and equipment are in a satisfactory state of cleanliness and there are specific and documented SOP for their cleaning | |

| Item | 14 | Litter Quality (Alternative systems) | |
|---|---|---|---|

**The assessor must evaluate litter's Wetness and Friability with a visual scoring system, following the instructions provided in the Manual. The final score will be classed as "inadequate" if the wetness and/or the friability score is between 1 and 5, as "acceptable" if both are between 6 and 8, and "optimal" if both are 9 or 10.**

| | |
|---|---|
| Wetness and/or Friability score between 1 and 5 | |
| Wetness and Friability score between 6 and 8 | |
| Wetness and Friability score between 9 and 10 | |

| AREA | B | EQUIPMENT AND FACILITIES |
|---|---|---|

| Item | 15 | Buildings and livestock housing | Directive 98/58/EC, Annex, Paragraph 8- 9 |
|---|---|---|---|

*"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 throughly cleaned and disinfected"*
*"Accommodation and fittings[...]shall be constructed and maintained so that there are no sharp edges or protrusions likely to cause injury to the animals."*

| | |
|---|---|
| Evidence of at least one no sufficient parameter | |
| All parameteres are sufficient | |

| Item | 16 | Buildings and livestock housing | Directive 1999/74/EC , Annex, Paragraph 5 |
|---|---|---|---|

*"Cages must be suitably equipped to prevent hens escaping"*

| | |
|---|---|
| Cages don't prevent hens escaping | |
| Cages prevent hens escaping | |

| Item | 17 | Inspection devices | Directive 1999/74/EC , Annex, Paragraph 6 |
|---|---|---|---|

*"Accommodation comprising two or more tiers of cages must have devices or appropriate measures must be taken to allow inspection of all tiers without difficulty and facilitate the removal of hens."*

| | |
|---|---|
| There are no devices or appropriate measures allowing inspection of all tiers without difficulty and facilitate the removal of hens | |
| There are devices or appropriate measuresallowing of all tiers without difficulty and facilitate the removal of hens | |

| Item | 18 | Cage door dimensions | Directive 1999/74/EC , Annex, Paragraph 7 |
|---|---|---|---|

*"The design and dimensions of the cage door must be such that an adult hen can be removed without undergoing unnecessary suffering or sustaining injury."*

| | |
|---|---|
| The design and dimensions of the cage door don't allow the removal of an adult hen without undergoing unnecessary suffering or sustaining injury | |
| The design and dimensions of the cage door allow the removal of an adult hen without undergoing unnecessary suffering or sustaining injury | |

| Item | 19 | Available space | Directive 98/58/EC, Annex, Paragraph 7 - Directive 1999/74/EC, Chapter III , Article 6 , Paragraph 1.a - Directive 1999/74/EC, Chapter I, Article 4, Paragraph 4 |
|---|---|---|---|

*"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, which means:*
*ENRICHED CAGES - 1. laying hens must have:*
*(a) at least 750 cm2 of cage area per hen, 600 cm2 of which shall be usable; the height of the cage other than that above the usable area shall be at least 20 cm at every point and no cage shall have a total area that is less than 2000 cm2;*
*ALTERNATIVE SYSTEMS - The stocking density must not exceed nine laying hens per m2 usable area"*

| | |
|---|---|
| Surface of cage area available for each hen not acceptable / Stocking density higher than the specified limits | |
| Surface of cage area available for each hen acceptable / Stocking density equal or lower than the specified limits | |
| Further increase in available space made available to animals:<br>ENRICHED CAGES: each laying hen has at least 900 cm² of cage area<br>ALTERNATIVE SYSTEMS: the stocking density is equal to or less than 8 laying hens for m² of usable area | |

| Item | 20 | Availability of feeders | Directive 98/58/EC, Annex, Paragraph 17 - Directive 1999/74/EC, Chapter III , Article 6 , Paragraph 2 - Directive 1999/74/EC, Chapter I, Article 4, Paragraph 1.a |
|---|---|---|---|

*"Feeding (..) equipment must be designed, constructed and placed so that contamination of food and water and the harmful effects of competition between the animals are minimised, which means:*

*ENRICHED CAGES - "A feed trough which may be used without restriction must be provided. Its length must be at least 12 cm multiplied by the number of hens in the cage"*
*ALTERNATIVE SYSTEMS - "either linear feeders providing at least 10 cm per bird or circular feeders providing at least 4 cm per bird"*

| | |
|---|---|
| Feeders are not properly organised | |
| Feeders are properly organised | |

| Item | 21 | Availability of drinkers | Directive 98/58/EC, Annex, Paragraph 17 - Directive 1999/74/EC, Chapter III , Article 6 , Paragraph 3 -Directive 1999/74/EC, Chapter I, Article 4, Paragraph 1.b |
|---|---|---|---|

*"(..) 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 minimised,which means:*

*ENRICHED CAGES -"Each cage must have a drinking system appropriate to the size of the group; where nipple drinkers are provided, at least two nipple drinkers or two cups must be within the reach of each hen;"*
*ALTERNATIVE SYSTEMS- "either continuous drinking troughs providing 2,5 cm per hen or circular drinking troughs providing 1 cm per hen.*
*In addition, where nipple drinkers or cups are used, there shall be at least one nipple drinker or cup for every 10 hens. Where drinking points are plumbed in, at least two cups or two nipple drinkers shall be within reach of each hen;"*

| | |
|---|---|
| Drinkers are not properly organised | |
| Drinkers are properly organised | |

| Item | 22 | Infirmary | Directive 98/58/EC, Annex, Paragraph 4 |
|---|---|---|---|

*"Where necessary sick or injured animals shall be isolated in suitable accomodation with, where appropriate, dry comfortable bedding."*

**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 represents a suggestion for the assessor, who should always consider every risk factor before expressing the evaluation**

| | |
|---|---|
| There is no suitable and identified accomodation for sick or injured animals | |
| There is a suitable and identified accomodation for sick and injured animals | |

| Item | 23 | Temperature and Relative Air Humidity | Directive 98/58/EC, Annex, Paragraph 10 |
|---|---|---|---|

*"(...)Temperature, relative air humidity (...) must be kept within*
**Temperature and Relative Air Humidity are strictly related to the ventilation system, which attendance and suitability should be considered by the assessor before expressing the evaluation.**

| | |
|---|---|
| Lack of mechanical ventilation | |
| Mechanical ventilation | |
| Mechanical ventilation together with cooling and heating systems with automatic monitoring enviromental parameters | |

| Item | 24 | Harmful gases | Directive 98/58/EC, Annex, Paragraph 10 |
|---|---|---|---|

*" (…) Gas concentrations must be kept within limits which are not harmful to the animals."*

**The suggested thresholds only represents a suggestion for the assessor, who should always consider every risk factor before expressing the evaluation**

| | |
|---|---|
| Gas concentrations are harmful to the animals (Thresholds: NH3 >20 ppm; CO2 > 3000 ppm) | |
| Gas concentrations are not harmful to the animals (Thresholds: NH3 < 20 ppm; CO2 < 3000 ppm) | |
| Gas concentrations are not harmful to the animals (Thresholds: NH3 < 20 ppm; CO2 < 3000 ppm) and at least one parameter (NH3 or CO2) is recorded and monitored continuously | |
| | |

| Item | 25 | Air dust | Directive 98/58/EC, Annex, Paragraph 10 |
|---|---|---|---|

*"(…) Dust levels must be kept within limits which are not harmful to the animals".*

**To evaluate Air dust levels, the assessor should use the "Dust sheet test", which is thoroughly described in the User's Manual**

| | |
|---|---|
| Dust levels are harmful to the animals | |
| Dust levels are not harmful to the animals | |
| No dust | |

| Item | 26 | Light levels | Directive 98/58/EC, Annex, Paragraph 11 - Directive 1999/74/EC, Annex , Paragraph 3 |
|---|---|---|---|

*"All buildings shall have light levels sufficient to allow all hens to see one another and be seen clearly, to investigate their surroundings visually and to show normal levels of activity"*

**"Sufficient light levels" means at least a 20 lux light intensity, measured at the animals'level in some different points of the shed ( above the feeder line, near the drinker line)**

| | |
|---|---|
| Lack of adequate light levels (natural or artificial) | |
| Proper lighting levels (natural or artificial) | |

| Item | 27 | Lighting regime | Directive 98/58/EC, Annex, Paragraph 11 - Directive 1999/74/EC, Annex, Paragraph 3 |
|---|---|---|---|

*"After the first days of conditioning, the lighting regime shall be such as to prevent health and behavioural problems. Accordingly it must follow a 24-hour rhythm and include an adequate uninterrupted period of darkness lasting, by way of indication, about one third of the day, so that the hens may rest and to avoid problems such as immunodepression and ocular anomalies."*

| | |
|---|---|
| The lighting regime is not appropriate | |
| The lighting regime is appropriate | |
| The lighting regime is adequate and guaranteed by automated control units | |

| Item | 28 | Twilight period | Directive 98/58/EC, Annex, Paragraph 11 - Directive 1999/74/EC, Annex, Paragraph 3 |
|---|---|---|---|

*"A period of twilight of sufficient duration ought to be provided when the light is dimmed so that the hens may settle down without disturbance or injury."*
**"Sufficient duration" means at least a 15 minutes-period of twilight**

| | |
|---|---|
| The twilight period is lacking or not sufficient | |
| The twilight period is present and sufficient | |
| The twilight period is present, of sufficient duration and guaranteed by an automated control unit | |

| Item | 29 | Uniformity of lighting (natural light farms) | Directive 1999/74/EC, Annex, Paragraph 3 |
|---|---|---|---|

*"Where there is natural light, light apertures must be arranged in such a way that light is distributed evenly within the accommodation."*

| | |
|---|---|
| Natural light not distributed evenly within the accomodation | |
| Natural light distributed evenly within the accomodation | |

| Item | 30 | Sound level | Directive 1999/74/EC, Annex, Paragraph 2 |
|---|---|---|---|

*"The sound level shall be minimised. Constant or sudden noise shall be avoided. Ventilation fans, feeding machinery or other equipment shall be constructed, placed, operated and maintained in such a way that they cause the least possible noise."*

| | |
|---|---|
| The sound level is loud | |
| The sound level is low | |

| Item | 31 | Daily water consumption | |
|---|---|---|---|

**Water consumption should be monitored daily with a meter, in order to point out promptly any abnormalities (that could be caused by pathologies or lack of animal welfare)**

| | |
|---|---|
| Lack of a water meter | |
| One water meter for every shed | |

| Item | 32 | Daily feed consumption | |
|---|---|---|---|

| |
|---|
| **Feed consumption should be monitored daily with a counter, in order to point out promptly any abnormalities (that could be caused by pathologies or lack of animal welfare)** |

| | |
|---|---|
| Lack of daily feed consumption measuring systems | |
| Evidence of daily feed consumption measuring systems and manual recordings of feed consumption | |
| Evidence of daily feed consumption measuring systems provided with automatic recordings of feed consumption (e.g. feed dispensing systems) | |

| Item | 33 | Nest (ENRICHED CAGES) | Directive 1999/74/EC, Article 2.b ; 2.d |
|---|---|---|---|

| |
|---|
| *"Nest means: a separate space for egg laying, the floor components of which may not include wire mesh that can come into contact with the birds, for an individual hen or for a group of hens (group nest);"*<br>*"Nesting areas shall not be regarded as usable areas."* |

| | |
|---|---|
| The nest is missing and/or unsuitable | |
| The nest is present and adequate | |
| The nest is present and well separated | |

| Item | 34 | Litter quality (ENRICHED CAGES) | Directive 1999/74/EC,Chapter III, Article 6, Paragraph 1.c |
|---|---|---|---|

| |
|---|
| *"Laying hens must have: litter such that pecking and scratching are possible"* |

| | |
|---|---|
| Litter is missing or inadequate | |
| Litter is adequate | |

| Elemento di verifica | 35 | Perches (ENRICHED CAGES) | Directive 1999/74/EC,Chapter III, Article 6, Paragraph 1.d |
|---|---|---|---|

| |
|---|
| *"Laying hens must have: appropriate perches allowing at least 15 cm per hen"*<br>**"Appropriate perches" means perches providing hens with a perception of elevation, designed so that they can reduce wounds and maximise the use** |

| | |
|---|---|
| No perches or not adequate perches ( approximately width< 1,5 cm or >10,5 cm), not allowing at least 15 cm per hen | |
| Appropriate perches ( approximately width between 1,5 and 3 cm or between 6 and 10,5 cm) allowing at least 15 cm per hen | |
| Appropriate perches ( approximately width between 3 and 6 cm) allowing at least 15 cm per hen | |

| Item | 36 | Size of areas between tiers of cages and between floor and cages (ENRICHED CAGES) | Directive 1999/74/EC,Chapter III, Article 6, Paragraph 4 |
|---|---|---|---|

*"To facilitate inspection, installation and depopulation of hens there must be a minimum aisle width of 90 cm between tiers of cages and a space of at least 35 cm must be allowed between the floor of the building and the bottom tier of cages;"*

| | |
|---|---|
| Evidence of at least one not sufficient parameter | |
| All parameters are sufficient | |

| Item | 37 | Claw-shortening devices (ENRICHED CAGES) | Directive 1999/74 EC, Chapter III, Article 6 , Paragraph 5 |
|---|---|---|---|

*"Cages must be fitted with suitable claw-shortening devices."*

**To avoid an excessive claw growth, which could lead to claw rupture or could be a risk for the other hens inside the same cage, cages must be fitted with suitable claw-shortening devices. The assessor should evaluate the suitability and efficacy of these devices by checking directly on the animals if there are some broken or too long claws.**

| | |
|---|---|
| Claw-shortening devices are missing or inadequate | |
| Claw-shortening devices are present and adequate | |

| Item | 38 | Nest (ALTERNATIVE SYSTEMS) | Directive 1999/74 EC, Chapter I, Article 4, Paragraph 1.c |
|---|---|---|---|

*"All systems must be equipped in such a way that all laying hens have: at least one nest for every seven hens. If group nests are used, there must be at least 1 m2 of nest space for a maximum of 120 hens;"*

| | |
|---|---|
| Number/size of nests not sufficient | |
| All parameters are sufficient | |
| There is at least 1 nest for 5 hens or 1m2 of nest space for less than 120 hens | |

| Item | 39 | Perches (ALTERNATIVE SYSTEMS) | Directive 1999/74 EC, Chapter I, Article 4, Paragraph 1.d |
|---|---|---|---|

*"All systems must be equipped in such a way that all laying hens have:*
*adequate perches, without sharp edges and providing at least 15 cm per hen. Perches must not be mounted above the litter and the horizontal distance between perches must be at least 30 cm and the horizontal distance between the perch and the wall must be at least 20 cm;"*

**"Appropriate perches" means perches providing hens with a perception of elevation, designed so that they can reduce wounds and maximise the use**

| | |
|---|---|
| No perches or not adequate perches ( approximately width< 1,5 cm or >10,5 cm), not allowing at least 15 cm per hen | |
| Appropriate perches ( approximately width between 1,5 and 3 cm or between 6 and 10,5 cm) allowing at least 15 cm per hen | |
| Appropriate perches ( approximately width between 3 and 6 cm) allowing at least 15 cm per hen | |

| Item | 40 | Litter (ALTERNATIVE SYSTEMS) | Directive 1999/74 EC, Chapter I, Article 4, Paragraph 1.e |
|---|---|---|---|

*"All systems must be equipped in such a way that all laying hens have: at least 250 cm2 of littered area per hen, the litter occupying at least one third of the ground surface."*

| | |
|---|---|
| Littered area is less than 250cm² per hen and/or is occupying less than one third of the ground surface | |
| Littered area is at least 250cm² per hen and/or is occupying at least one third of the ground surface | |
| The litter area is more than 500 cm²/hive and occupies at least half of the floor area | |

| Item | 41 | Flooring (ALTERNATIVE SYSTEMS) | Directive 1999/74 EC, Chapter I, Article 4, Paragraph 2 |
|---|---|---|---|

*"The floors of installations must be constructed so as to support adequately each of the forward-facing claws of each foot."*

| | |
|---|---|
| The floors don't support adequately each of the forward-facing claws of each foot | |
| The floors support adequately each of the forward-facing claws of each foot | |

| Item | 42 | Number of overlapping levels (ALTERNATIVE SYSTEMS AVIARIES) | Directive 1999/74 EC, Chapter I, Article 4,Paragraph 3.a.i |
|---|---|---|---|

*"If systems of rearing are used where the laying hens can move freely between different levels, (i) there shall be no more than four levels"*

| | |
|---|---|
| Aviaries with a number of overlapping levels equal to or greater than 5 | |
| Aviaries with a number of overlapping levels equal to or lower than 4 | |

| Item | 43 | Headroom between levels (ALTERNATIVE SYSTEMS AVIARIES) | Directive 1999/74 EC, Chapter I, Article 4,Paragraph 3.a.ii |
|---|---|---|---|

*"If systems of rearing are used where the laying hens can move freely between different levels, (ii) the headroom between the levels must be at least 45 cm"*

| | |
|---|---|
| Aviary with an headroom shorter than 45 cm | |
| Aviary with an headroom equal or higher than 45 cm | |

| Item | 44 | Feeders and drinkers (ALTERNATIVE SYSTEMS AVIARIES) | Directive 1999/74 EC, Chapter I, Article 4,Paragraph 3.a.iii |
|---|---|---|---|

*"If systems of rearing are used where the laying hens can move freely between different levels, (iii) the drinking and feeding facilities must be distributed in such a way as to provide equal access for all hens"*

| | |
|---|---|
| Equal access is not provided to feeders and drinkers for all hens | |
| Equal access is provided to feeders and drinkers for all hens | |

| Item | 45 | Protection from falling of droppings (ALTERNATIVE SYSTEMS AVIARIES) | Directive 1999/74 EC, Chapter I, Article 4,Paragraph 3.a.iv |
|---|---|---|---|

*"If systems of rearing are used where the laying hens can move freely between different levels, (iv) the levels must be so arranged as to prevent droppings falling on the levels below."*

| | |
|---|---|
| Aviaries which systems don't prevent droppings falling on the levels below | |
| Aviaries which systems prevent droppings falling on the levels below | |

| Item | 46 | Size of pop holes (ALTERNATIVE SYSTEMS FREE RANGE) | Directive 1999/74 EC, Chapter I, Article 4,Paragraph 3.b.i |
|---|---|---|---|

*"If laying hens have access to open runs:(i) there must be several pop holes giving direct access to the outer area, at least 35 cm high and 40 cm wide and extending along the entire length of the building; in any case, a total opening of 2 m must be available per group of 1 000 hens"*

| | |
|---|---|
| Evidence of at least one not sufficient parameter | |
| All parameters are sufficient | |

| Item | 47 | Outer space availability (ALTERNATIVE SYSTEMS FREE RANGE) | Commission Delegated Regulation (EU) 2017/2168 Annex, Paragraph 1.c - Directive 1999/74, Chapter I, Paragraph 3.b.ii - Paragraph 4 |
|---|---|---|---|

*"The maximum stocking density of open-air runs must not be greater than 2 500 hens per hectare of ground available to the hens or one hen per 4 m2 at all times. However, where at least 10 m2 per hen is available and where rotation is practised and hens are given even access to the whole area over the flock's life, each paddock used must at any time assure at least 2,5 m2 per hen"*

| | |
|---|---|
| The outer surface does not guarantee the correct density of animals | |
| The outer surface ensures the correct density of animals | |

| Item | 48 | Outdoor shelters (ALTERNATIVE SYSTEMS FREE RANGE) | Directive 98/58/CE, Annex, Paragraph 12 - Commission Delegated Regulation (EU) 2017/2168 Annex, Paragraph 1.d - Directive 1999/74, Chapter I, Paragraph 3.b.2 |
|---|---|---|---|

*"Animals not kept in buildings shall where necessary and possible be given protection from adverse weather conditions, predators and risks to their health"* *"Open-air runs must not extend beyond a radius of 150 m from the nearest pophole of the building. However, an extension of up to 350 m from the nearest pophole of the building is permissible provided that a sufficient number of shelters as referred to in Article 4(1)(3)(b)(ii) of Directive 1999/74/EC are evenly distributed throughout the whole open-air run with at least four shelters per hectare"*

| | |
|---|---|
| Evidence of at least one not sufficient parameter | |
| All parameters are sufficient | |

| Item | 49 | Further use of open runs (ALTERNATIVE SYSTEMS FREE RANGE) | Commission Delegated Regulation (EU) 2017/2168 Annex, Paragraph 1.b |
|---|---|---|---|

*" Open-air runs to which hens have access must be mainly covered with vegetation and not be used for other purposes except for orchards, woodland and livestock grazing if the latter is authorised by the competent authorities"*

| | |
|---|---|
| Open runs unfit for rearing | |
| Open runs fit for rearing | |

| Item | 50 | Enviromental enrichments (ALTERNATIVE SYSTEMS) | |
|---|---|---|---|

*Sources of environmental enrichment, such as substrates that stimulate and satisfy pecking behaviour in search of food, should be equally distributed and accessible to the animals. For example, straw balls, mineral pecking blocks of alfalfa are effective materials that hens are happy to use. Using the right environmental enrichments will help prevent plumofagia and cannibalism*

| | |
|---|---|
| Enrichments not provided | |
| A suitable and well-distributed enrichment is provided for every 2,000 animals | |
| Two or more different and well-distributed suitable enrichments are provided per 2,000 animals | |

| AREA | C | ANIMAL BASED MEASURES |
|---|---|---|

| Item | 51 | Mutilations | Directive 98/58 CE, Annex, Paragraph 19 - Directive 1999/74 EC, Annex, Paragraph 8 |
|---|---|---|---|

*"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."*
*"Without prejudice to the provisions of point 19 of the Annex to Directive 98/58/EC, all mutilation shall be prohibited. In order to prevent feather pecking and cannibalism, however, the Member States may authorise beak trimming provided it is carried out by qualified staff on birds that are less than 10 days old and intended for laying."*

| | |
|---|---|
| At least one hen with prohibited mutilations or permitted mutilations which don't meet the requirements | |
| Hens with permitted mutilations | |
| All animals are intact without mutilations | |

| Item | 52 | Average weekly mortality | |
|---|---|---|---|

The average weekly mortality is obtained by summing the weekly mortalities divided by the number of weeks since housing. The weekly mortality is defined as the number of deaths (including culls) recorded during a week, divided by the number of animals present on the previous seventh day, expressed as a percentage. It is equivalent to using the most recent cumulative mortality figure to divide by the number of weeks since housing. The figure is reliable if evaluated on a production cycle that has exceeded at least the 45th week since housing the pullets, otherwise the average weekly mortality figure of the previous cycle is also taken into account.

| | |
|---|---|
| Average weekly mortality rate higher than 0,2% | |
| Average weekly mortality rate between 0,1% and 0,2% | |
| Average weekly mortality rate lower than 0,1% | |

| AREA | | MAJOR RISKS AND ALARM SYSTEMS |
|---|---|---|

| Item | 53 | Lighting available for inspection | Directive 98/58 CE, Annex, Paragraph 3 |
|---|---|---|---|

*"Adequate lighting (fixed or portable) shall be available to enable the animals to be thoroughly inspected at any time."*

| | |
|---|---|
| Lack of adequate lighting (fixed or portable) available for inspection | |
| Presence of adequate lighting (fixed or portable) available for inspection | |

| Item | 54 | Inspection of automated and mechanical equipment | Directive 98/58 CE, Annex, Paragraph 13 |
|---|---|---|---|

*"All automated or mechanical equipment essential for the health and well-being of the animals must be inspected at least once daily"*

| | |
|---|---|
| Automated and mechanical equipment are inspected less than once daily | |
| Automated and mechanical equipment are inspected at least once daily | |
| Automated and mechanical equipment are inspected 1 or more times a day and presence of a documented plan of emergencies | |

| Elemento di verifica | 55 | Alarm system | Directive 98/58 CE, Annex, Paragraph 13 |
|---|---|---|---|

*"In the event of a fault in the [ventilation] system, an alarm system must be provided to signal the fault. This alarm system must be regularly checked*

**Facilities that are essential for animal health and welfare, such as the ventilation system, must be equipped with an alarm system; this alarm system must be regularly checked and maintained. If the herd does not require an artificial ventilation system assign an acceptable response. The improved rating can be awarded in the presence of an alarm system that also concerns other systems (apart from the ventilation system) that are indispensable for the survival and well-being of the animals (e.g. feeding/watering systems)**

| | |
|---|---|
| Absence of an alarm system at the artificial ventilation system and/or absence of regular checks | |
| Presence of a regularly monitored alarm system in the artificial ventilation system | |
| 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 | |

| Item | 56 | Inspection of automated and mechanical equipment | Directive 98/58 CE, Annex, Paragraph 13 |
|---|---|---|---|

*"Where the health and well-being of the animals is dependent on an artificial ventilation system, provision must be made for an appropriate backup system to guarantee sufficient air renewal to preserve the health and well-being of the animals."*

**The best judgement can be assigned in case of a documented plan about managing emergency situation or accidents**

| | |
|---|---|
| Lack/unsuitability of the backup system, in case of artificial ventilation | |
| Presence of an appropriate backup system | |
| Presence of an additional and formal emergency plan | |

| Item | 57 | Presence of a current source | |
|---|---|---|---|

**A corrent source must be available to provide for all electric equipment essential for the well-being of laying hens in case of lack of electricity**

| | |
|---|---|
| Lack of current source/Not working | |
| Presence of a working current source | |
| Presence of a working current source, provided with documents certifying regular inspections | |

| Item | 58 | Water supply system | |
|---|---|---|---|

**Provisions should be adopted to ensure a water supply in case of emergency (e.g. lack of the regular supply)**

| | |
|---|---|
| Lack of a water supply system | |
| Presence of temporary solutions to ensure water supply (e.g.tanker) | |
| Opportunity to draw water from the aqueduct or presence of alternative source | |

| Item | 59 | Medication Record | Directive 98/58 CE, Annex, Paragraphs 5-6 |
|---|---|---|---|

*"The owner or keeper of the animals shall maintain a record of any medicinal treatment given [...]. Where equivalent information is required to be kept for other purposes, this shall also suffice for the purposes of this Directive."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"*

| | |
|---|---|
| The medication record is missing and/or the medication record hasn't been kept for the given period and/or is not correctly completed | |
| Presence of the medication record, well mantained and correctly completed | |

| Elemento di verifica | 60 | Mortality Record | Directive 98/58 CE, Annex, Paragraphs 5-6 |
|---|---|---|---|

| *"The owner or keeper of the animals shall maintain a recordof the number of mortalities found to each inspection" "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"* | |
|---|---|
| The mortality record is missing and/or the mortality record hasn't been kept for the given period and/or is not correctly completed | |
| Presence of the mortality record, well mantained, kept for the given period and correctly completed | |

| Elemento di verifica | 61 | Administration of illegal substances | Directive 98/58 CE, Annex, Paragraph 18 - Dir. 96/22/EEC, Art. 1, Paragraph 2 , Letter c |
|---|---|---|---|

| *"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."* | |
|---|---|
| Administration of illegal substances | |
| No illegal substances administered | |

Istituto Zooprofilattico Sperimentale della Lombardia e dell'Emilia Romagna

CLASSYFARM

EURCAW Poultry SFA

# ANIMAL WELFARE:

# GUIDELINES FOR RISK CATEGORISATION IN THE REARING OF LAYING HENS

# Summary

# THE ASSESSMENT OF GOOD WELFARE CONDITIONS IN LIVESTOCK BREEDING

The Ministry of Health, through the Istituto Zooprofilattico Sperimentale della Lombardia e dell'Emilia Romagna (IZSLER), has since 2004 made use of the expertise of the National Reference Centre for Animal Welfare (CReNBA), which carries out technical-scientific support activities promoting research and training in the field of animal welfare.

Establishing what is a good level of welfare for farmed animals is undoubtedly a complex exercise as it is possible to confuse their actual living conditions with one's own expectations and the specific knowledge that everyone has in the field of animal husbandry.

From a medical-scientific point of view, the 'diagnosis of the welfare level' of a farmed animal must necessarily be based on the analysis of many factors related to the animal's living conditions, its needs and its ability to adapt to the environment. All these conditions must be recorded and evaluated through specific indicators and the results analysed through a method that is as objective and scientific as possible. Ultimately, the evaluation of animal welfare is a difficult exercise of abstraction from the usual and daily sanitary, zootechnical or affective approach that each person can put in place when dealing with farm animals in various ways.

In particular, it is interesting to recall the recent Regulation (EU) 2016/429 on Transmissible Animal Diseases (Animal Health Law) applicable from 21 April 2021, at recital 7 of which it states that 'animal health and animal welfare are interlinked: better animal health promotes greater animal welfare, and vice versa'. Furthermore, in Article 4 it clarifies that a hazard is defined as a pathogen or condition of an animal or its product that is capable of causing an adverse effect on human or animal health (point 21); whereas a risk is defined as the likelihood of the occurrence and the probable magnitude of the biological and economic consequences of an adverse effect on human or animal health, given exposure to a hazard (point 22).

For this reason, the Ministry of Health, with the support of the CReNBA, basing itself on the current regulations on the protection of animals on farms, on the checklists already used for the controls of the public veterinary services and on the most recent studies available on the subject, has developed new checklists, with the aim of making the verification of animal welfare conditions on Italian farms easier and in line with the new requirements.

The final objective of the application of the new protocol, in addition to allowing the identification of situations that do not comply with current regulations, will also be to be able to categorise farms into risk bands and develop targeted and effective control plans. The new system could in fact make it possible to classify farms in various ways, the simplest and most immediately comprehensible and usable of which could be to differentiate them into 3 levels of risk:

- level 1 = high risk, inadequate/negative/dangerous or stressful condition; it indicates the possibility that a part of the animals is experiencing or may experience a negative situation ("distress"), due to the inability to fully enjoy one or more of the 5 freedoms;
- level 2 = controlled risk or acceptable condition, normal and compatible with the possibility of all animals in the group being able to enjoy their 5 freedoms and not experiencing distress
- level 3 = low risk or optimal, positive and beneficial condition, due not only to the full adaptation of the animal to its environment and to the respect of the 5 freedoms, but also to the possibility of being able to live positive, satisfying and satisfying experiences capable of producing "eustress".

The animal welfare assessment procedure, which is the basis of the CReNBA system, considers the requirements of Council Directive 98/58/EC concerning the protection of animals kept form farming purposes and the Council Directive 1999/74/EC laying down minimum standards for the protection of laying hens. To these, are added the numerous indications contained in the reports and scientific publications of the most important European research groups and bodies, including the European Food Safety Authority (EFSA).

The method is based on the analysis of two groups of data: those linked to hazards deriving from environmental conditions (management, facilities, equipment and microclimatic conditions), including the parameters foreseen by 98/58/EC and 1999/74/EC and those deriving from the detection of the most important direct welfare indicators or animal-based measures (ABMs) foreseen by the most recent scientific literature. The first parameters are collected in 3 risk areas: Area A – “Management"; Area B - "Equipment and facilities" and Area of " Major risks and alarm systems"; for each of them, when foreseen, the corresponding non-compliance category is reported, for Commission Decision of 14-11-2006 concerning minimum requirements for the collection of information during the inspections of production sites on which certain animals are kept for farming purposes (art. 3 point c and Annex II). For the second group of parameters (ABMs), relating to the analysis of the presence or absence of adverse effects on animal welfare, a fourth area is reserved (Area C) with the main "Animal-based measures".

The ultimate aim is to be able to compare different farms on the basis of the same assessments, ensuring the greatest objectivity in measuring the welfare conditions in which animals live.

This manual contains all the observations contained in the new checklist. In particular, the parameters required by law are preceded by the legal provision prescribing them, while for all other measures the specific indications from EFSA opinions or official guidelines relating to them are given. Finally, each observation is followed by a brief explanation on the subject, with the aim of illustrating the condition to be assessed in greater depth and helping the veterinarian to make the best decision.

The observation and detection activities of the evaluating veterinarian are mainly divided into three options:

- "INSUFFICIENT" or "not in compliance with legal parameters": i.e. conditions that may prevent one or more animals in the poultry house from meeting their biological needs and enjoying the 5 freedoms that are the basis of animal welfare;
- "ACCEPTABLE" or "within legal parameters": i.e. living conditions that, with some exceptions, guarantee the satisfaction of the 5 freedoms and psychophysical needs for all the animals present;
- "OPTIMAL" or "exceeding legal parameters": i.e. the presence of particular positive conditions that ensure that all animals enjoy optimum conditions that are clearly better than the legal minima.

The end result of the application of the evaluation system is to identify not only possible criticalities (legislative non-compliances), but also to identify, through a numerical index obtained from the processing of all the information, the overall risk level of the farm. To this is the partial result of each assessment area, which gives an indication of the weight and importance that each of them has in the final composition of the risk index. All this information could also be useful for appropriately targeting preventive interventions on the main factors of weakness in the herd, thereby improving the living conditions of the animals.

At the end of the entire evaluation process a document is produced to process the data and summarise of critical points (illustrated at the end of this manual) in which are presented:

▪ the overall animal welfare value (overall risk level), relating to the conditions of the animals on the farm;

▪ the value of each of the 4 assessment areas;

▪ the critical points found, with an indication of possible legal non-compliance.

# FIELD APPLICATION OF THE SYSTEM

This work protocol serves to detect legislative non-compliances with better accuracy and to assess the 'welfare risk' related to managerial and structural aspects of the farm. An important implementation of the work is provided by the observation of animals on the farm for the detection of some important ABMs that can detect poor welfare conditions even when no negative environmental situations are detected. This is possible because the condition of poor welfare can be linked to the animal's inability to adapt to environments that are even suitable from a regulatory point of view.

In this handbook topics are covered for both enriched cage farms and alternative and free-range systems. Many assessment parameters are identical for all types of animal husbandry. Others, however, contain very different observations and indications due to their particular structures and equipment and will be described contextually.

The possibility of using the procedures in this manual and of accessing the data processing programme is only open to veterinarians who have attended and passed a specific course for Animal Welfare Assessors held by their colleagues in regional public health and territorial IIZZSS.

# Area A: Management

Farm management is fundamental to animal welfare and includes all those operations that involve animal handlers. Although the structural characteristics of a farm instinctively, may seem more important in terms of their effect on animal welfare conditions, the conditions of the animals, the latter are actually more influenced by the day-to-day management of the main routine activities performed by staff. The staff assessment area considers the number of staff working on the farm, in relation to the in relation to the number of animals cared for, their level of technical expertise in carrying out the activities that most affect animal welfare and how they work on a daily basis to ensure comfortable living conditions for the animals.

## A.1 Staffing

*"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**<br>**STAFFING**<br>*(Category of non-compliance: Staffing)* |
|---|
| *"Animals shall be cared for by a sufficient number of staff"*<br>**The suggested thresholds only represents a suggestion for the assessor, who should always consider every risk factor before expressing the evaluation** |
| Inadequate number of staff:<br>ALTERNATIVE SYSTEMS: approximately one person for more than 35.000 animals<br>ENRICHED CAGES: approximately one person for more than 50.000 animals |
| Adequate number of staff:<br>ALTERNATIVE SYSTEMS: approximately one person for 15.000 - 35.000 animals |

| |
|---|
| ENRICHED CAGES: approximately one person for 30.000 - 50.000 animals |
| Optimal number of staff:<br><br>ALTERNATIVE SYSTEMS: approximately one person for less than 15.000 animals<br><br>ENRICHED CAGES: approximately one person for less than 30.000 animals |

Employees are people working in poultry farming to take care both of birds and facilities. An adequate number of staff allows to identify possible indications of poor welfare conditions promptly. It is difficult to define what should be the sufficient number of staff since this is related to many factors such as farm layout, technology, staff quality etc.

There are no specific, ABIs although there is an exhausting list of indirect ABIs (number of dead chickens, 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 MBIs (such as wet litter areas, leaking drinkers, lack of feed in the feeders, dust levels, noxious gas concentrations).

The Classyfarm check-list includes thresholds coming from field experts. Given the variability of the farming systems and the level of automation of the plants, it is not always possible to define a precise number of employees, therefore each evaluation must be made taking into consideration each individual case based on the use of iceberg indicators.

One worker for 15,000-30,000 animals is considered sufficient in the case of alternative systems (more complex to manage and inspect) or one worker for 30,000-50,000 animals in the case of cage systems. The optimal situation foresees an attendant for less than 15000 animals.

# A.2 Staffing - Training

*"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 2**<br><br>**TRAINING**<br>*(Category of non-compliance: Staffing)* |
|---|
| *""Staff members possess the appropriate ability, knowledge and professional competence""*<br><br>**The limits indicated are only an aid for the evaluator who must however, consider all the risk factors of the herd before making a judgement.** |
| Inadequate skills and knowledge: indicative experience of less than 10 years and no training on animal welfare |
| Appropriate skills and knowledge: indicative experience of at least 10 years and no animal welfare training (or combination thereof) |
| Optimal skills and knowledge: Indicative experience of at least 10 years with relevant qualification or relevant training course followed within the last 3 years |

Evaluate the overall skills of the animal handler, which may be either of practical origin (because provided by experience) or of theoretical origin (e.g. qualification).

Long practical experience in the sector is considered acceptable or, in its absence (e.g. young breeders), the attainment of relevant qualifications (diploma or degree in agriculture, veterinary medicine and similar short degrees) or participation in courses in the field.

In order to assign an optimal judgement, it is necessary to have both requirements: prolonged experience and qualification degree/specific training. Training or refresher courses should be repeated on a regular intervals during the working period (at least 1 course every 3 years). If the farm is attended by more than one operator, participation in the training courses of even one employee (either the owner or the hired employee) is considered sufficient. Mench and Rodenburg, 2018 showed that an appropriate manipulation of animals reduces stress and hen's probability to get hurt and can improve meat quality. Therefore, it is important that the staff members receive appropriate instructions on how to deal with animals and the correct behaviour they should express.

In order to achieve the optimal score, the staff members should take specific courses regarding animal welfare and the assessor should verify the presence of a certificate proving the attendance to the course.

## A.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."* (Directive 98/58/EC, Annex, Paragraph 2).
*"All hens must be inspected by the owner or the person responsible for the hens at least once a day."* (Directive 1999/74, Annex, Paragraph 1).

| **Item 3**<br>**NUMBER OF INSPECTIONS**<br>*(Category of non-compliance: Inspection)* |
|---|
| *"All hens must be inspected by the owner or the person responsible for the hens at least once a day"* |
| Less than 1 inspection/day |
| 1 or more inspection/day |
| 2 or more inspections/day and written/informatic records of welfare problems encountered |

All laying hens 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, in order to promptly identify the potential dangers for hen welfare and health (including both behavioural and physiological needs) and provide rapid and effective operations.
In order to achieve the highest score, the keeper should carefully inspect all the animals at least twice a day, with particular attention to the injured animals housed in the infirmary. Moreover, the keeper (or the employees) should also write/record any clinical sign/anomaly/lesion seen in the flock or verify hens' performance and data provided by the automatic systems.
The assessor should verify the compliance to the requirement through:
- interviews
- checking the SOPs

In order to give the "Optimal" score, the assessor should check if there are any written/computerized records of the problems encountered during the inspections.

# A.4 Management of injured or ill animals

*"Any animal which appears to be ill or injured must be cared for appropriately without delay"* (Directive 98/58/EC, Annex, Paragraph 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 4**<br>**MANAGEMENT OF INJURED OR ILL ANIMALS**<br>*(Category of non-compliance: Inspection)* |
|---|
| *"Any animal which appears to be ill or injured must be cared for appropriately without delay"*<br>*"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."*<br>**Injured or ill hens which are in severe pain shall be given appropriate veterinary treatment or are killed without delay** |
| Presence of ill or injured animals poorly managed |
| Presence of ill or injured animals well managed |

Together with the daily inspections of the animals, it is of fundamental importance that the keeper and the employees notice any early signs of illness or discomfort in one or more birds and that they act promptly to resolve them. The corrective actions implemented by the keeper or by the employees may include: consultation with the company veterinarian, the isolation of the sick / injured animals in an infirmary area (solution applicable for example to weak subjects subdue to feather-pecking by dominant birds), or, if there is no other economically viable solution, the killing with methods permitted by EC Reg. 1099/2009 (generally cervical dislocation) of the subject in question.

# A.5 Veterinary advice

*"Where an animal does not respond to such care, veterinary advice must be obtained as soon as possible."* (Directive 98/58/CE, Annex, Paragraph 4).

| **Item 5** |
|---|
| **VETERINARY ADVICE**<br>*(Category of non-compliance: Inspection)* |
| *"Where an animal does not respond to such care, veterinary advice must be obtained as soon as possible"*<br>**In poultry farming this legal reference must be intended as a group and not individual health issue** |
| A veterinary advice is not requested even if necessary |
| A veterinary advice is requested if necessary |

If a group of birds show signs of disease or discomfort and all the care and interventions given by the keeper do not achieve any effect, it is mandatory to contact a veterinarian.

In order to have evidence that sick or injured animals that do not react to the care given by employees, receive adequate treatment, it is possible to verify through an interview whether the presence of the company veterinarian or a freelance or private veterinarian who follows the company is declared or documented, as well as view any prescriptions, treatment records or intervention reports issued following the visit.

The assessor should verify the compliance to the requirement through the Inspection of animals (flock health issues with no evidence of veterinarian consultation/intervention, i.e., sudden rises in mortality, respiratory syndromes, intestinal disorders etc.), and documentary check of:

- Attendance records;
- Treatment records;
- Possible records of operations issued by the Veterinarian who acted

# A.6 Dead animal removal

*"Dead hens must be removed every day"* (Directive 1999/74/EC, Annex, Paragraph 4).

| **Item 6**<br>**DEAD ANIMALS REMOVAL**<br>*(Category of non-compliance: Buildings and accommodation)* |
|---|
| *"Dead hens must be removed every day"* |
| Dead hens are not removed every day |
| Dead hens are removed every day |

In order to verify the compliance to the requirement, the assessor should look carefully to see if there are long dead hens (over a day).

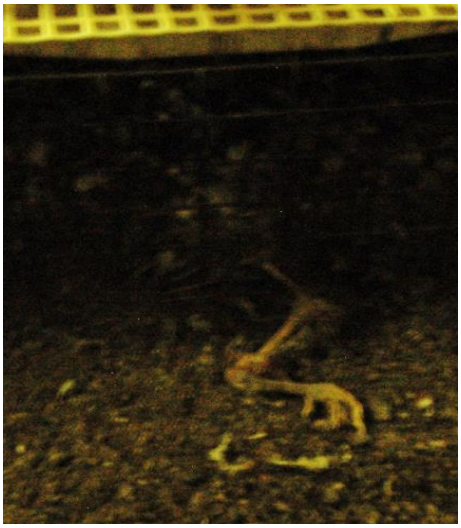


Figure 1.Remains of a long-dead animal

# A.7 Manure management

*"Droppings must be removed as often as necessary"* (Directive 1999/74/EC, Annex, Paragraph 4).

| **Item 7**<br><br>**MANURE MANAGEMENT**<br>*(Category of non-compliance: Buildings and accommodation)* |
|---|
| *"Droppings must be removed as often as necessary"*<br>**Before making the judgement, the assessor should consider equipment and facilities inside the shed (litter, belts, scrapers) and environmental conditions at the time of the evaluation (smell of ammonia, wet litter, etc.)** |
| Droppings are not removed as often as necessary |
| Droppings are removed as often as necessary / Deep litter |

If droppings are not removed regularly they can accumulate and be a problem for animal health and welfare, as air quality gets worse and pathologies can spread faster. The legislation is not specific on the frequency ("as often as necessary"). It is necessary to ask the breeder how many times he removes the faeces and compare this information with the quantity of faeces actually present and, above all, with the quality of the air. In the case of farms on permanent bedding, being normally removed at the end of the cycle, it is necessary to evaluate the environmental conditions (air quality) and the management of the same (excessively humid bedding) at the time of evaluation.

# A.8 Breeding procedures

*"Natural or artificial breeding or breeding procedures which case or are likely to cause suffering or injury to any of the animals concerned must not be practised. This provision shall not preclude the use of certain procedures likely to cause minimal or momentary suffering or injury, or which might necessitate interventions which would not cause lasting injury, where these are allowed by national provisions"* (Directive 98/58/EC, Annex, Paragraph 20).

*"No animal shall be kept for farming purposes unless it can reasonably be expected, on the basis of its genotype or phenotype, that it can be kept without detrimental effect on its health or welfare"* (Directive 98/58/EC, Annex, Paragraph 21).

| **Item 8**<br>**BREEDING PROCEDURES**<br>*(Category of non-compliance: Breeding procedures)* |
|---|
| *"Natural or artificial breeding or breeding procedures which cause or are likely to cause suffering or injury to the animals concerned must not be practised. This provision does not preclude the use of certain procedures which may cause minimal or momentary suffering or injury or require interventions which do not cause lasting injury, if permitted by national provisions."* |
| Forced moulting is practised or unforced moulting is not performed in accordance with legislation |
| Slow or unforced moulting is practised in accordance with legislation |
| Moulting is not practised |

Laying hens are usually induced to moult after about 12 to 14 months of laying, when productivity tends to decrease; the aim of this technique is to induce such stress in the animal stress that leads to a rapid loss of plumage and a return to production, with improved productive performance, such as laying rate, shell quality and albumen height. The aim is achieved through several days of fasting, reduced water intake and reduced light hours.

Forced moulting is prohibited by current legislation, as the basic principles of animal welfare are not guaranteed (in this case, the principles of animal welfare are not guaranteed, in which case the judgement will be poor); instead, the so-called slow or unforced moulting is allowed. Judgement will be optimal if no moult is performed.

# A.9 Feeding management

*"Animals must be fed a wholesome diet which is appropriate to their age and species and which is fed to them in sufficient quantity to maintain them in good health and satisfy their nutritional needs"* (Directive 98/58/EC, Annex, Paragraph 14).

| **Item 9**<br>**FEEDING MANAGEMENT**<br>*(Category of non-compliance: feed, water and other substances)* |
|---|
| *"Animals must be fed a wholesome diet which is appropriate to their age and species and which is fed to them in sufficient quantity to maintain them in good health and satisfy their nutritional needs"* |
| Diet is not appropriate to animals' needs and/or it is not made up of wholesome food |
| Diet is appropriate to animals' needs and it is made up of wholesome food |

# A.10 Type of feeding

*"All animals must have access to feed at intervals appropriate to their physiological needs"* (Directive 98/58/EC, Annex, Paragraph 15).

| **Item 10**<br>**TYPE OF FEEDING**<br>*(Category of non-compliance: feed, water and other substances)* |
|---|
| *"All animals must have access to feed at intervals appropriate to their physiological needs"* |
| Inadequate access to food: the feed is not guaranteed in 24 hours and/or is distributed at intervals inappropriate to animals' physiological needs |
| Adequate access to food: the feed is guaranteed in 24 hours and it is distributed at intervals appropriate to animals' physiological needs |
| Ad libitum feeding |

Diet should provide enough energy, nutrients and fiber to meet nutritional requirements of hens. In general, it is best to have an expert nutritionist and staff responsible for feed preparation and distribution. During the laying phase, the feed program generally has three main stages:

1. Beginning of laying phase → peak of oviposition (36th week): feed consumption ≃ 90-100 grams/day;
2. 36th week → 52nd week: drop of egg laying. Peak of hen's calcium need and increase of egg's weight;
3. 52nd week → end of cycle: further increase of egg's weight.

Feed formulation during 2nd and 3rd stages should reflect the lower energy need and the increasing calcium need.

The assessor should verify that the feed amount and composition is adequate based on animal's age and deposition phase. The feed particles should be uniform in size and not too grinded, in order to avoid an intake decrease. The particles shouldn't be too gross either, because in that situation there could be a selection in the feed intake and an unbalanced nutrient intake. The table below shows the ideal characteristics of feed particles (Source: HyLine-Brown Management).

| **Particles size** | **Percentage in the feed for animals in laying phase** |
|---|---|
| < 1 mm | < 15% |
| 1-2 mm | 20-30% |
| 2-3 mm | 30- 40% |
| > 3 mm | 10-15% |

Table 1: Optimal feed particle profile for hens in production (from Hyline-Brown Management Guide, modified)

The feed quantity administered should consider feed composition, breeding system, percentage of deposition and temperature (during summer, for example, it is recommended to split the feed supplied in two or more meals during the day, possibly during the fresher hours).

The quality of feed must be adequate, and the feed itself has to be kept in appropriate spaces (siloes, stores, barns), that could protect it from mould and harmful agents. The assessor should check if the storage of feed is well conducted.

Furthermore, the assessor should verify, through the inspection of labels, the quality and appropriateness of the feed for any specific deposition phase.

# A.11 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/CE, Annex, Paragraph 16).

| **Item 11** |
|---|
| **WATER QUALITY**<br>*(Category of non-compliance: feed, water and other substances)* |
| *"All animals must have access to a suitable water supply or be able to satisfy their fluid intake needs by other means."*<br>**Water quality must be evaluated. For the water amount assessment, check at "Drinkers' availability" item.** |
| Well or surface water not properly treated or analytically tested |
| Well or surface water subjected to appropriate treatment or analytical control |
| Aqueduct water or well or surface water subjected to at least one microbiological and chemical control yearly and evidence and adequacy of a SOP regarding water quality management |

In animal husbandry there are no specific requirements and legislation on the quality of water intended for animal consumption. If water comes from a municipal supply, there are usually less quality issues. Water from wells or boreholes, may have excessive nitrate levels and high bacterial counts, due to run-off from fertilized fields.

The Council Directive 98/83/EC of 3 November 1998 on the quality of water intended for human consumption regulates the quality of drinking water and includes some parameters that must be subjected to check monitoring (Annex II):

- microbiological parameters (i.e. E.coli);
- chemical parameters (i.e. Aluminium, Ammonium, Nitrite);
- indicators (i.e. Taste, Odour, Colour, Turbidity).

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 this item, the assessor should consider:

- results of the last water analysis;

- visual inspection of water leaking through drinkers: if water lines and water sanitation are not adequate, there will be a high level of particulate matter;
- evidence and adequacy of a SOP regarding water quality management.

# A.12 Maintenance of drinkers

"Drinkers must:
(a) be positioned at the correct height in relation to the size and age of the animals;
(b) have an appropriate design."
(RSPCA, 2017)

| **Item 12** |
|---|
| **MAINTENANCE OF DRINKERS**<br>*(Category of non-compliance: feed, water and other substances)* |
| **To prevent the deterioration of environmental conditions, drinkers must be organised and maintained in order to minimise losses. Moreover, they must be suitably placed and adapted to the age of the animals.** |
| Drinkers that lose water and/or clogged and/or badly located |
| Drinkers that are not losing water, not clogged, well located |
| Drinkers that are not losing water, not clogged, well located and evidence of POS related to drinkers' management |

The correct positioning and operation of drinking troughs is essential to ensure easy access to water and to avoid deterioration of the litter. Drinking troughs should in fact be positioned according to the age and size of the animal, following the manufacturer's instructions. It is essential to facilitate access to drinking troughs as much as possible, using age-appropriate types and positioning the drinking troughs at the right height. For example, when using drip drinkers, the pullets should stand with their head upwards and their neck extended so as to trigger the water release device; conversely, if cup drinkers are used, they must be positioned at back height. Linear or circular drinking troughs are permitted for laying hens, but drip troughs complete with a tray underneath are preferable.
During the inspection of the shed, the assessor should observe all drinkers and check their proper functioning, positioning and cleaning conditions.

# A.13 State of cleanliness

*"While the cages are occupied, the surfaces and all equipment shall be kept satisfactorily clean"* (Directive 1999/74/EC, Annex, Paragraph 4).

| **Item 13**<br>**STATE OF CLEANLINESS**<br>*(Category of non-compliance: Buildings and accommodation)* |
|---|
| *"While the cages are occupied, the surfaces and all equipment shall be kept satisfactorily clean"*<br>**The assessor must evaluate the fully house cleanliness condition, including equipment and facilities (feeders, drinkers, perches, nests)** |
| The surfaces and all equipment are not satisfactorily clean |
| The surfaces and all equipment are satisfactorily clean |
| The surfaces and equipment are in a satisfactory state of cleanliness and there are specific and documented SOP for their cleaning |

All parts of buildings, utensils and equipment must be cleaned and disinfected thoroughly at the end of each rearing cycle and before a new flock is introduced into the house.
During the rearing cycle it is impossible to prevent the accumulation of dust and organic waste (feathers, cobwebs), however all buildings and equipment must be kept in acceptable conditions.
In order to verify the compliance to the law, the assessor should consider the fully house cleanliness condition, the evidence of old cobwebs on ceilings and walls, the accumulation of an excessive amount of dust and organic waste on surfaces.

# A.14 Litter quality (Alternative systems)

*"The litter must:*
*(a) be made of suitable material;*
*(b) be kept dry and friable, and replaced when necessary;*
*(c) be deep enough to ensure proper dilution of faeces;*
*(d) allow the animals to practise 'dust bathing' (sand bathing, species-specific behaviour specific behaviour);*

*(e) be supplemented daily, if necessary, with clean litter;*

*(f) be managed in accordance with hygienic standards;*

*(g) be stored in dry, hygienic, rodent-proof premises (virgin litter ed.)"* (RSPCA, 2017)

| **Item 14** |
|---|
| **LITTER QUALITY (ALTERNATIVE SYSTEMS)**<br>*(Category of non-compliance: Buildings and accommodation)* |
| **The assessor must evaluate litter's Wetness and Friability with a visual scoring system, following the instructions provided in the Manual. The final score will be classed as "inadequate" if the wetness and/or the friability score is between 1 and 5, as "acceptable" if both are between 6 and 8, and "optimal" if both are 9 or 10.** |
| Wetness and/or Friability score between 1 and 5 |
| Wetness and Friability score between 6 and 8 |
| Wetness and Friability score between 9 and 10 |

In types of farming where permanent litter is provided, its correct management is a good hygienic practice, important during all stages of rearing. It has been shown that good litter of good quality, kept dry and friable, is the most important factor in the prevention of negative behaviour among animals such as cannibalism.

Litter must be:

● dry and friable on the surface: it is therefore necessary for the breeder to remove wet and encrusted and add dry material if necessary;

● removed completely at the end of the cycle to allow cleaning and disinfection of the premises.

Moisture in litter is one of the main problems in poultry production, as it affects negatively affects animal health, welfare and performance.

In particular, the water content of litter represents one of the main causes of the development of foot pad dermatitis (FPD), a disease that manifests itself with the initial formation of crusts and later of actual ulcers of the foot tissue, with serious compromise of animal welfare.

A study carried out on turkeys bred for meat production (Vinco et al., 2018) has introduced a new and practical method for litter moisture assessment, which can be applied in the field without the use of specific instruments, based on the assignment of a visual score of moisture and friability of the litter.

The evaluator is advised to stand about 6-7 metres from the entrance of the shed and assess the condition of the litter (approx. 1 square metre of extension) at three points representatives of the entire

shed, in order to have a more complete view of its condition. The evaluator assigns a score from 1 to 10 at each point for friability and moisture, using the table below as an aid below.

Finally, he/she will assign an insufficient rating when the moisture and/or friability score is less than or equal to 5, an acceptable rating when both are between 6 and 8, an optimum rating when both scores are 9 or 10. In farming systems where the litter consists predominantly of of poultry manure, the absence or presence of a low amount of friable material (this is especially the case if the inspection is carried out at the beginning of the cycle).

On the other hand, litter that is milled and added when necessary and that is removed entirely at the end of the cycle to allow cleaning and disinfection operations.

| Score | Friability | Humidity |
|---|---|---|
| **1** | Completely caked | Wet litter, total area, water is appearing by pressure on the litter |
| **2** | 80-90 % area caked | Wet litter, beneath drinker line, water appearing by pressure on the litter |
| **3** | 70-80 % area caked | Wet litter, beneath drinker line, no water appearing by pressure on the litter |
| **4** | 60-70 % area caked | Wet litter, dark coloured. Litter can be pressed into ball-shape |
| **5** | 50-60 % area caked | Wet litter, dark coloured. Ridges occur beneath the drinking line |
| **6** | 40 % area caked | Almost dry litter, small ridges beneath drinking line. Litter between drinking line and feeders is still friable |
| **7** | 30 % area caked | Almost dry litter, dark coloured beneath drinking line and in other areas light coloured, ridge formation beneath drinking lines just started |
| **8** | 10 % area caked | Almost dry litter, light coloured, no ridges beneath drinking line |
| **9** | Friable litter, small caked areas | Dry litter, light coloured |
| **10** | Friable litter, no caked areas | Very dry litter (only observed at start) |
| * | Large scabs: clearly visible, all along the drinking line | |
| ** | Small scabs, clearly visible at the beginning of the drinking line | |
| *** | Initial scabs: slightly visible | |

Table 2: Description of visual litter evaluation scores for humidity and friability.

# AREA B. Equipment and facilities

Like management and environmental hygiene, livestock facilities and equipment also represent a threat to animal welfare. In assessing the welfare of laying hens it is very important, apart from the stocking density, the adequacy of the facilities housing the animals. The housing structures, in addition to not being harmful, should be able to allow laying hens to display their behavioural repertoire. Finally, it is important to remember that a farm should have suitable supplementary facilities for handling special situations (e.g. an infirmary).

In reality, between a correct environmental or managerial condition and the welfare of the animal, there is the animal's ability to adapt; therefore, the operator assessing the adequacy of facilities must pay attention to the 'welfare risk' they pose and less to the zootechnical efficiency or even the architectural appearance of the farm.

Within this area of evaluation is also included the analysis of the equipment necessary for the control of microclimatic conditions in the poultry house (temperature, humidity and air quality) which most affect the laying hen's living conditions. The adequacy of rearing facilities and installations is an essential component to be considered when assessing the welfare of the laying hen. The legislation itself establishes, for the facilities/equipment, very specific minimum requirements. However, rearing facilities can be very complex and vary from one farm to another; for this reason, it may be of help to the assessor to request, prior to the date of the visit, documentation on the size and characteristics of the breeding facilities (detailed plan with dimensions and specifications of perches, nests, feeder and watering lines, any other facilities...). Considering the data in this documentation, and knowing the number of animals housed, the evaluator can calculate whether the maximum densities are respected and whether the minimum number of facilities required is met. This is then followed by a further control phase on the farm, in which the evaluator must check the correspondence between what is declared in the plans and the situation on the farm.

# B.15 Buildings and livestock housing (1)

*"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, Paragraph 8)

*"Accommodation and fittings[...]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, Paragraph 9)

| **Item 15**<br>**BUILDINGS AND LIVESTOCK HOUSING**<br>*(Category of non-compliance: 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"*<br>*"Accommodation and fittings[...]shall be constructed and maintained so that there are no sharp edges or protrusions likely to cause injury to the animals."* |
| Evidence of at least one no sufficient parameter |
| All parameters are sufficient |

# B.16 Buildings and livestock housing (2)

*"Cages must be suitably equipped to prevent hens escaping".* (Directive 1999/74/EC, Annex, Paragraph 5)

| **Item 16**<br>**BUILDINGS AND LIVESTOCK HOUSING**<br>*(Category of non-compliance: Buildings and accommodation)* |
|---|
| *"Cages must be suitably equipped to prevent hens escaping"* |
| Cages don't prevent hens escaping |
| Cages prevent hens escaping |

All materials and facilities in contact with hens and all the surfaces with which the animals may come into contact must not be harmful to the animals and must not have sharp edges or protrusions likely to cause injury to the hens.

In order to verify the compliance to this requirement, the assessor should evaluate the evidence of sharp edges and protrusions which could be harmful to the animals, and should check if there are animals with lesions which could be caused by cutting surfaces.

At the same time, all this equipment must be conceived, constructed and maintained in such a way that they can be carefully cleaned and disinfected. Depending on the type of farm, effective measures must be taken to prevent animals from running away. In this regard, the assessor must ensure that there are no cages with broken parts or open doors and that the fences are intact.

Figure 2: Hen found outside cage

# B.17 Inspection devices

*"Accommodation comprising two or more tiers of cages must have devices or appropriate measures must be taken to allow inspection of all tiers without difficulty and facilitate the removal of hens."* (Directive 1999/74/EC, Annex, Paragraph 6).

| **Item 17**<br>**INSPECTION DEVICES**<br>*(Category of non compliance: Inspection)* |
|---|
| *"Accommodation comprising two or more tiers of cages must have devices or appropriate measures must be taken to allow inspection of all tiers without difficulty and facilitate the removal of hens."* |
| There are no devices or appropriate measures allowing inspection of all tiers without difficulty and facilitate the removal of hens |
| There are devices or appropriate measures allowing of all tiers without difficulty and facilitate the removal of hens |

In case of cages accommodation with two or more floors, the assessor should check if there are adequate systems to allow the inspection of all the levels.

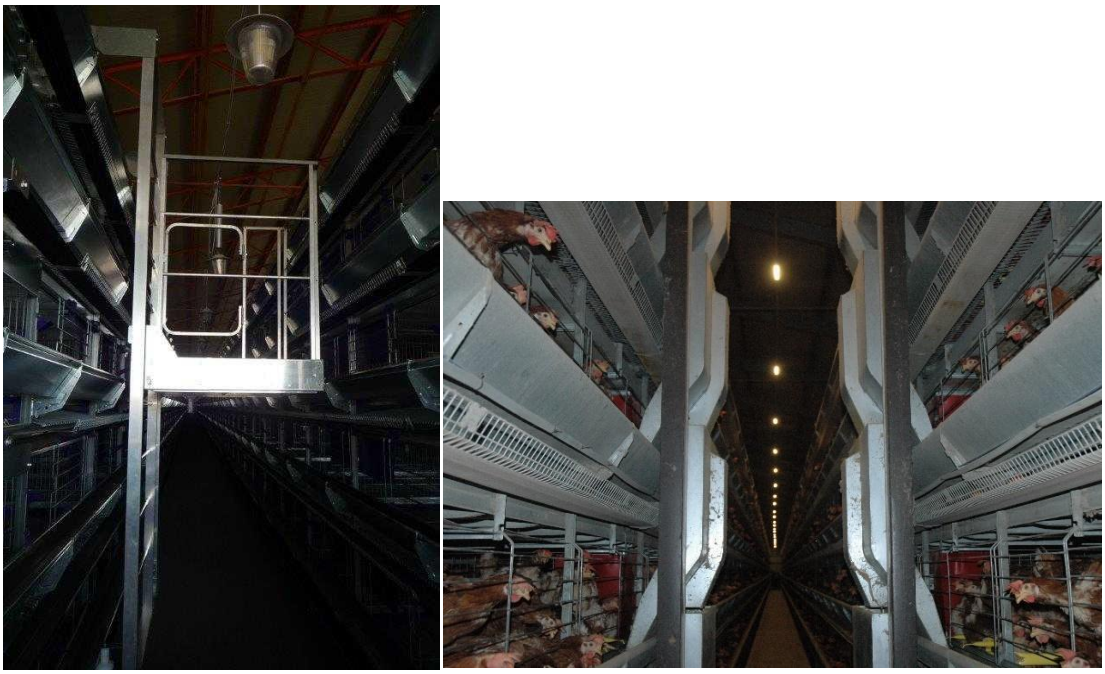


Figure 3: Devices for ispect cages

# B.18 Cage door dimensions

*"The design and dimensions of the cage door must be such that an adult hen can be removed without undergoing unnecessary suffering or sustaining injury."* (Directive 1999/74/EC, Annex, Paragraph 7).

| **Item 18**<br>**CAGE DOOR DIMENSIONS**<br>*(Category of noncompliance: Buildings and accommodation)* |
|---|
| *"The design and dimensions of the cage door must be such that an adult hen can be removed without undergoing unnecessary suffering or sustaining injury."* |
| The design and dimensions of the cage door don't allow the removal of an adult hen without undergoing unnecessary suffering or sustaining injury |
| The design and dimensions of the cage door allow the removal of an adult hen without undergoing unnecessary suffering or sustaining injury |

The assessor should verify that each cage door has adequate characteristics (dimension and material, lack of protrusions) and allows the manipulation of hens without causing injuries or pain.

# B.19 Available space

*"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"* (Directive 98/58/EC, Annex, Paragraph 7).

*"Provisions applicable to rearing in enriched cages:*

*laying hens must have: at least 750 cm2 of cage area per hen, 600 cm2 of which shall be usable; the height of the cage other than that above the usable area shall be at least 20 cm at every point and no cage shall have a total area that is less than 2000 cm2;"* (Directive 1999/74/EC, Chapter III, Article 6, Paragraph 1.a).

*"Provisions applicable to alternative systems:*

*The stocking density must not exceed nine laying hens for m2 of usable area"* (Directive 1999/74/EC, Chapter I, Article 4, Paragraph 4).

| **Item 19** |
|---|
| **AVAILABLE SPACE**<br>*(Category of noncompliance: 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, which means:*<br>*ENRICHED CAGES - 1. laying hens must have:*<br>*(a) at least 750 cm2 of cage area per hen, 600 cm2 of which shall be usable; the height of the cage other than that above the usable area shall be at least 20 cm at every point and no cage shall have a total area that is less than 2000 cm2;*<br>*ALTERNATIVE SYSTEMS - The stocking density must not exceed nine laying hens per m2 usable area"* |
| Surface of cage area available for each hen not acceptable / Stocking density higher than the specified limits |
| Surface of cage area available for each hen acceptable / Stocking density respect specified limits |
| Further increase in available space made available to animals:<br>ENRICHED CAGES: each laying hen has at least 900 cm² of cage area<br>ALTERNATIVE SYSTEMS: the stocking density is equal to or less than 8 laying hens for m² of usable area |

The Directive 1999/74/EC describes the usable area as follows:

*"usable area' means: an area at least 30 cm wide with a floor slope not exceeding 14 %, with headroom of at least 45 cm. Nesting areas shall not be regarded as usable areas."*

Uncovered outdoor space is not considered as "usable area". In order to calculate the stocking density in these areas, see item B.54.

Available space is tightly correlated to other factors, such as ventilation, temperature, litter quality. If these aspects are not adjusted for the increase of stocking density, animal welfare could be seriously affected.

With inadequate stocking density, animals could have different problems: difficulty moving, incapability to avoid conspecific aggressiveness, inadequate period of rest, health issues. Indeed, high stocking densities have been associated with higher incidence of feet and legs illness, breast blisters and respiratory diseases (Mench, 2018).

The assessor should verify usable area in official documentation and calculate the densities. The parameters shown in table 3 must be respected.

| BREEDING SYSTEM | | DENSITY |
|---|---|---|
| **Alternative systems** | Usable area | 9 hens / 10000 $cm^2$ |
| **Enriched cages*** | Total cage area | 1 hen / 750 $cm^2$ |
| | Usable area | 1 hen / 600 $cm^2$ |

*Table 3: Maximum expected density for each breeding system*

* The values indicated assume that the cage height of the areas other than the usable area is greater than 20 cm at every point and that the total cage area is greater than 2000 cm2

# B.20 Availability of feeders

*"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 minimised."* (Directive 98/58/EC, Annex, Paragraph 17).

*"Provisions applicable to rearing in enriched cages":*

*2. Feeders which may be used without restriction must be provided. Its length must be at least 12 cm multiplied by the number of hens in the cage"* (Directive 1999/74/EC, Chapter III, Article 6, Paragraph 2).

*"Provisions applicable to alternative systems":*

*1. All systems must be equipped in such a way that all laying hens have:*

*(a) either linear feeders providing at least 10 cm per bird or circular feeders providing at least 4 cm per bird;"* (Directive 1999/74/EC, Chapter I, Article 4, Paragraph 1.a).

| **Item 20**<br><br>**AVAILABILITY OF FEEDERS**<br>*(Category of noncompliance: Feed, water and other substances)* |
|---|
| *"Feeding (..) equipment must be designed, constructed and placed so that contamination of food and water and the harmful effects of competition between the animals are minimised, which means:*<br>*ENRICHED CAGES - "A feed trough which may be used without restriction must be provided. Its length must be at least 12 cm multiplied by the number of hens in the cage"*<br>*ALTERNATIVE SYSTEMS - "either linear feeders providing at least 10 cm per bird or circular feeders providing at least 4 cm per bird"* |
| Feeders are not properly organised |
| Feeders are properly organised |

Feeding equipment should have adequate dimensions and materials in order to guarantee an even and easy access of hens to the feeders, and to avoid the competition between the animals.

The assessor should verify that the feeder dimensions shown in the table below are fulfilled:

| **BREEDING SYSTEM** | **FEEDER TYPE** | **NECESSARY FEEDING SPACE** |
|---|---|---|
| Enriched cages | Linear | At least 12 cm /hen |
| Alternative systems | Linear | At least 10 cm /hen |
| | Circular | At least 4 cm /hen |

Table 4: Feeder space required for each hen

# B.21 Availability of drinkers

*"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 minimised.*" (Directive 98/58/EC, Annex, Paragraph 17).

*"Provisions applicable to rearing in enriched cages:*
*3. each cage must have a drinking system appropriate to the size of the group; where nipple drinkers are provided, at least two nipple drinkers or two cups must be within the reach of each hen;*" (Directive 1999/74/EC, Chapter III , Article 6 , Paragraph 3).

*"Provisions applicable to alternative systems:*
*1. All systems must be equipped in such a way that all laying hens have:*
*(b) either continuous drinking troughs providing 2,5 cm per hen or circular drinking troughs providing 1 cm per hen. In addition, where nipple drinkers or cups are used, there shall be at least one nipple drinker or cup for every 10 hens. Where drinking points are plumbed in, at least two cups or two nipple drinkers shall be within reach of each hen;"* (Directive 1999/74/EC, Chapter I, Article 4, Paragraph 1.b).

| **Item 21**<br><br>**AVAILABILITY OF DRINKERS**<br>*(Category of non compliance: Feed, water and other substances)* |
|---|
| *"(..) 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 minimised, which means:*<br>*ENRICHED CAGES -"Each cage must have a drinking system appropriate to the size of the group; where nipple drinkers are provided, at least two nipple drinkers or two cups must be within the reach of each hen;"*<br>*ALTERNATIVE SYSTEMS- "either continuous drinking troughs providing 2,5 cm per hen or circular drinking troughs providing 1 cm per hen.* |
| Drinkers are not properly organised |
| Drinkers are properly organised |

Like the feeders, also the drinkers should avoid competition between the hens. Water must be always provided, and the drinkers regularly checked to promptly detect malfunctioning or other problems. Water consumption could vary according to environmental temperature and feed consumption: between 20°C and 25°C the water: feed consumption rate is 2:1, but when the temperature rises above 25°C, the rate could increase up to 3:1 (5:1 when above 30°C).

Water administration could be based on different systems:

- linear drinkers: not so common today, this system is based on a long tank in which the water level is kept constant by a floating device;
- nipple drinkers (with or without cup): this is the most common system, because it avoids water spillage on the litter and water contamination;
- circular drinkers.

The assessor should verify that the number of drinkers required (see table below) is present in the farm.

| | | |
|---|---|---|
| Enriched cages | at least two nipple drinkers or two cups for each hen | |
| Alternative systems | DRINKER TYPE | SPACE/NUMBER NEEDED |
| | Linear | At least 2,5 cm /hen |
| | Circular | At least 1 cm /hen |
| | Nipple/cups | At least 1 / 10 hens |

Table 5: Nipple drinkers required for each laying hen

The assessor could follow the indication below in order to assess the adequacy of drinkers:

- Linear drinkers: measure the usable perimeter of one drinker and multiply by the number of drinkers in the shed. Divide this number by the number of animals at the beginning of the cycle.
- Circular drinkers: calculate the circumference of one drinker (C = radius*2*π), then multiply it by the number of drinkers in the shed and divide the result by the number of animals at the beginning of the cycle.
- Nipples/Cups: count the number of drinkers in one cage and multiply it by the number of cages in the shed; then, divide the result by the number of animals at the beginning of the cycle. If the rearing system is an alternative system, measure the distance between the drinkers and divide the length of the shed by this distance; in this way it is possible to know the number of drinkers in each line. Then, multiply the result by the number of drinker lines and divide it by the number of animals at the beginning of the cycle.

# B.22 Infirmary

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

*"Facilities must be available to temporarily segregate sick or injured birds and must: a) be within the main house b) provide birds with easily accessible food and water c) allow birds to rest quietly without disturbance d) provide dry, friable material easily accessible to all birds e) be inspected at least 3 times daily and records made"* (RSPCA, 2017)

| **Item 22**<br>**INFIRMARY**<br>*(Category of non compliance: Buildings and accommodation)* |
|---|
| "Where necessary sick or injured animals shall be isolated in suitable accommodation with, where appropriate, dry"<br>**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.** |
| There is no suitable and identified accommodation for sick or injured animals |
| There is a suitable and identified accommodation for sick and injured animals |

Sick and injured animals should be immediately identified, cared and, if necessary, isolated from the others. For this purpose, every farm should have isolated sectors, easily accessible or which can be prepared when needed. In order to guarantee adequate comfort to the animals, stocking density should be low inside such accommodation.

The assessor should verify the presence of (or the possibility to prepare) an adequate infirmary.

# B.23 Temperature and Relative Air Humidity

*"(...)Temperature, relative air humidity (...) must be kept within limits which are not harmful to the animals".* (Directive 98/58/CE, Annex, Paragraph 10).

*"The thermoneutral zone for adult layers is wider than for pullets being reared, and it is estimated to be in the range of 12-24°C. Outside this range hens may adapt to temperatures to some extent by changing their behaviour and their feed (energy) and water consumption, and in the case of high temperatures, by increasing their dissipation of body heat by means of a increasing heat loss by water ingestion. When environmental temperature approaches body temperature (40.6-41.9°C) there is an increased risk of death of birds by heat stress".* (EFSA, 2005)

| **Item 23**<br>**TEMPERATURE AND RELATIVE AIR HUMIDITY**<br>*(Category of non compliance: Buildings and accommodation)* |
|---|
| *"(...)Temperature, relative air humidity (...) must be kept within limits which are not harmful to the animals"*<br>**Temperature and Relative Air Humidity are strictly related to the ventilation system, which attendance and suitability should be considered by the assessor before expressing the evaluation** |
| Lack of adequate ventilation |
| Adequate ventilation, natural or mechanical |
| Mechanical ventilation (tunnel) together with cooling and heating systems with automatic monitoring environmental parameters |

The control of environmental parameters in laying houses is important to prevent heat stress. The consequences of heat stress may be reduction of body weight and bone mineral reserves, important decreases in number and size of eggs, poor shell quality (because of reduced calcium ingestion and absorption and respiratory alkalosis), with subsequent increase of cracked eggs, slower gut transit rate and impaired intestinal absorption and feed efficiency; also, wet faeces, causing dirty eggs, and wet litter in non-cage systems, and finally an increase of mortality. It also increases risks of feather pecking and cannibalism. Heat stress may promote a great rise in plasma corticosterone levels, decrease plasma thyroxine and triiodothyronine levels, and also impair immunity, in all cases to an extent that no other

climate stressor can produce (EFSA, 2005). Layers can cope with increasing temperatures up to 28-32º C, but above this range the effect of heat stress increase exponentially. Hens may also cope more easily with cyclic temperatures than with (almost) constant high temperature, but the concurrent effects of other environmental stressors, such as dust, ammonia, noise or wet litter will aggravate the effects of excessive temperature.

In cage systems it is known that that layers housed in the upper tiers of cages may suffer more from heat stress than those housed in the lower levels, while in alternative systems the most important factor in determining heat stress is stocking density.

The opposite problem (cold stress) is far less important in practice, since layers may cope more easily with low temperatures, near to 0ºC.

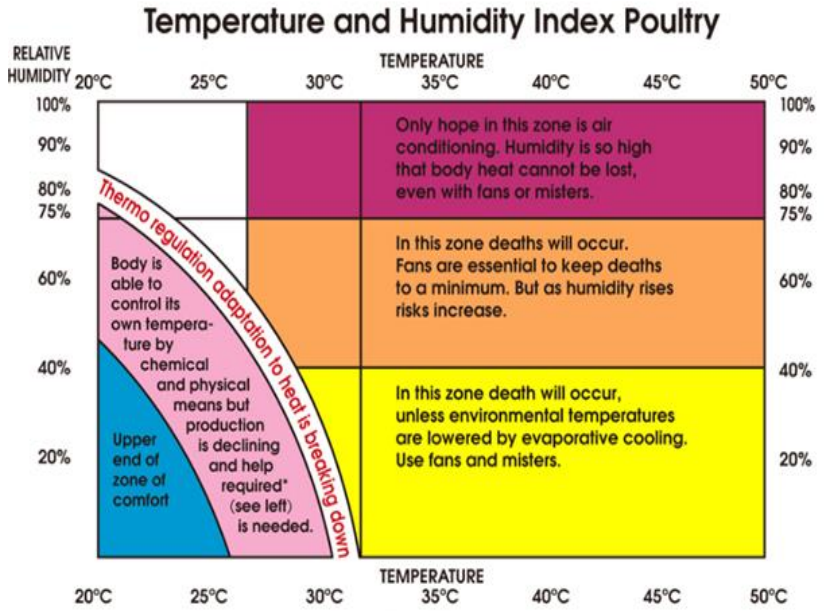
Concerning relative air humidity, the optimal level should be between 50% and 70%, while a level above 70% could cause issues relating to wet litter.

In order to ensure that hens have access to a thermally comfortable environment at all times, the assessor should first measure the environmental temperature and air humidity levels with a specific instrument at animal height (or should observe both parameters in the control unit recordings) and then compare the results obtained with the table below, which shows and in a simple and practical way all the thermal comfort/discomfort areas.

Based on this Table, all the areas can be divided in:

- **light blue area**: within this range of temperature and relative humidity hens are in an optimal condition of thermal comfort;
- **pink area:** within this range of temperature and humidity hens are not in an optimal state of thermal comfort but they can compensate with systems of thermoregulation (environmental conditions can be considered as “acceptable”);

- **areas above the white line (yellow, orange and purple):** the thermoregulation systems are unable to compensate the heat stress caused by the environmental conditions, which can be considered "inadequate" by the assessor.




# B.24 Harmful gases

*" (...) Gas concentrations must be kept within limits which are not harmful to the animals."* (Directive 98/58/EC, Annex, Paragraph 10)

| **Item 24**<br>**HARMFUL GASES**<br>*(Category of non compliance: Buildings and accommodation)* |
|---|
| *" (...) Gas concentrations must be kept within limits which are not harmful to the animals."*<br>**The suggested thresholds only represent a suggestion for the assessor, who should always consider every risk factor before expressing the evaluation** |
| Gas concentrations are harmful to the animals (Thresholds: NH3 >20 ppm; CO2 > 3000 ppm) |
| Gas concentrations are not harmful to the animals (Thresholds: NH3 < 20 ppm; CO2 < 3000 ppm) |
| Gas concentrations are not harmful to the animals (Thresholds: NH3 < 20 ppm; CO2 < 3000 ppm) and at least one parameter (NH3 or CO2) is recorded and monitored continuously |

David et al. (2015), show that air quality is generally worse in barn systems, because the levels of dust, ammonia, bacteria and endotoxins are higher compared to what happens in cages (especially during winter, when the ventilation rate is reduced).

High concentrations of ammonia (along with dust), could lead to conjunctivitis, bronchitis, asthma, allergies and could facilitate secondary infections.

A level of ammonia lower than 20 ppm and of carbon dioxide lower than 3000 ppm are acceptable. The assessor should measure the gases concentration at animal height in different places of the shed. If the assessor doesn't have a gas meter, he/she could check the control unit, since the latest models keep record of gas levels. People vary in their ability to smell ammonia, however, if ammonia can be smelt, it is likely to be too high and suggests monitoring and action is required.

For the evaluation of the presence of harmful gases in alternative laying hen systems, the method recommended by (EURCAW – Poultry- SFA, 2020), based on the French and Swiss Competent Authority protocol, can be used.

In the case of gas measurement in multitier systems, measurements of both NH3 and CO2 are taken 6 times in 6 different house points, at birds' heads height for 1 minute, considering the airflow from the ventilation:

- 3 points on the floor
- 2 points at the first tier
- 1 point at the second tier

For the calculation, the average of the six measurements can be considered or the highest measurement by verifying its compliance with legislation.

Finally, it is recommended to compare the result of these measurements with those of the environmental control unit, where available.

# B.25 Air dust

*"(...) Dust levels must be kept within limits which are not harmful to the animals."*(Directive 98/58/EC, Annex, Paragraph 10)

| **Item 25**<br>**AIR DUST**<br>*(Category of non compliance: Buildings and accommodation)* |
|---|
| *"(...) Dust levels must be kept within limits which are not harmful to the animals".*<br>**To evaluate Air dust levels, the assessor should use the "Dust sheet test".** |
| Dust levels are harmful to the animals |
| Dust levels are not harmful to the animals |
| No dust |

According to EFSA (2005) the bulk of the cage layer dust is flaky and cellular, consisting of skin debris interspersed with some food particles. Another common particle is broken feather barbules, while in alternative systems the dust also contains particles from the litter material.

Anderson and colleagues (1966) said that the dust content of air in a poultry house increases with an increase in the activity of the birds; more recent studies have shown average increases in dust levels of 5-15 times in aviary systems compared to cages, as well as bacterial concentrations and endotoxin levels. Dust in a poultry house may serve as a pathogen disseminator, causing many infections of the air sacs and diseases of the respiratory tract.

The main lesions in the respiratory tract are caused by both large dust particles (3.7-7 µm), which are deposited in the anterior portion of the system, and small particles (1.1- 0.091 µm), which are distributed throughout the rest of the system and reaching air sacs.

In order to evaluate the air dust level in a simple and fast way, it is recommended to use the “Dust sheet test”, as described in “Welfare Quality Protocol ®” (2019) and *EURCAW – Poultry – SFA (2020)*.

The dust sheet test requires black A5 or A6 size papers. They should be placed horizontally in four different locations in the barn, out of reach of the birds, but not too close to feeders or other equipment causing dust. The black papers should be placed horizontally (one in each location), when the inspector first enter the barn, and then removed for assessment after 2 to 3 hours.

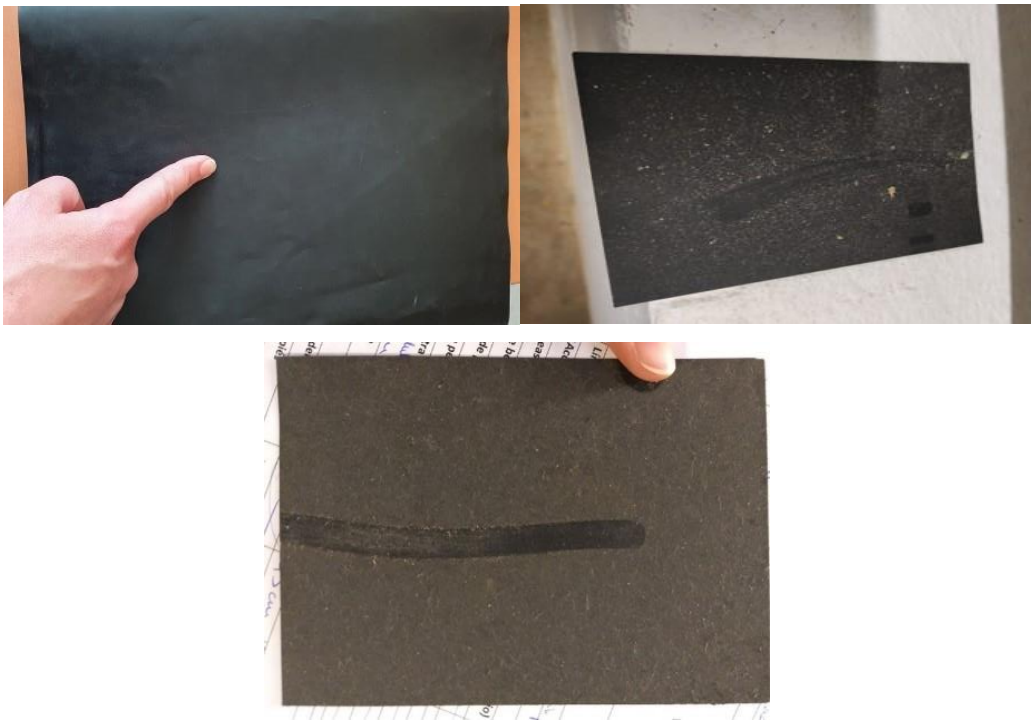
Classify the dust level found on the papers, comparing to a clean sheet, as follows:

Score 0: No or minimal evidence of dust (sheet has same colour as clean sheet)

Score 1: Isolated specks or a thin layer of dust on sheet is detectable (without comparing with a clean sheet, the test sheet still appears black but there is a slight colour difference between the 2 sheets).

Score 2: Dust covers the sheet, even without comparing with a clean sheet it is clear that the test sheet is no longer black i.e. (there is a clear difference in colour between clean and test sheets).

The assessor should consider not adequate the score 2; adequate score 1 and optimal score 0.



Dust sheet test scoring. Left: score **0**; Right: score **1**; Below: score **2** (Credit to: EURCAW-Poultry-SFA, 2022)

# B.26 Light levels

# B.27 Lighting regime

# B.28 Twilight period

# B.29 Uniformity of lighting (natural light farms)

*"Animals kept in buildings must not be kept either in permanent darkness or without an appropriate period of rest from artificial lighting. Where the natural light available is insufficient to meet the physiological and ethological needs of the animals, appropriate artificial lighting must be provided."* (Directive 98/58/EC, Annex, Paragraph 11)

*"All buildings shall have light levels sufficient to allow all hens to see one another and be seen clearly, to investigate their surroundings visually and to show normal levels of activity. Where there is natural light, light apertures must be arranged in such a way that light is distributed evenly within the accommodation. After the first days of conditioning, the lighting regime shall be such as to prevent health and behavioural problems. Accordingly, it must follow a 24-hour rhythm and include an adequate uninterrupted period of darkness lasting, by way of indication, about one third of the day, so that the hens may rest and to avoid problems such as immunodepression and ocular anomalies. A period of twilight of sufficient duration ought to be provided when the light is dimmed so that the hens may settle down without disturbance or injury."* (Directive 1999/74/EC, Annex, Paragraph 3).

| **Item 26**<br>**LIGHT LEVELS**<br>*(Category of non compliance: Minimum lighting)* |
|---|
| *"All buildings shall have light levels sufficient to allow all hens to see one another and be seen clearly, to investigate their surroundings visually and to show normal levels of activity"*<br>**"Sufficient light levels" means at least a 20 lux light intensity, measured at the animals level in some different points of the shed (above the feeder line, near the drinker line)** |
| Lack of adequate light levels (natural or artificial) |
| Proper lighting levels (natural or artificial) |

| **Item 27** |
|---|
| **LIGHTING REGIME**<br>*(Category of non compliance: Minimum lighting)* |
| *"After the first days of conditioning, the lighting regime shall be such as to prevent health and behavioural problems. Accordingly, it must follow a 24-hour rhythm and include an adequate uninterrupted period of darkness lasting, by way of indication, about one third of the day, so that the hens may rest and to avoid problems such as immunodepression and ocular anomalies."* |
| The lighting regime is not appropriate |
| The lighting regime is appropriate |
| The lighting regime is appropriate and guaranteed by automated control units |

| **Item 28** |
|---|
| **TWILIGHT PERIOD**<br>*(Category of non compliance: Minimum lighting)* |
| *"A period of twilight of sufficient duration ought to be provided when the light is dimmed so that the hens may settle down without disturbance or injury."*<br>**"Sufficient duration" means at least a 15 minutes-period of twilight** |
| The twilight period is lacking or not sufficient |
| The twilight period is present and sufficient |
| The twilight period is present, of sufficient duration and guaranteed by an automated control unit |

| **Item 29** |
|---|
| **UNIFORMITY OF LIGHTING (NATURAL LIGHT FARMS)**<br>*(Category of non compliance: Minimum lighting)* |
| *"Where there is natural light, light apertures must be arranged in such a way that light is distributed evenly within the accommodation."* |
| Natural light not distributed evenly within the accommodation |
| Natural light distributed evenly within the accommodation |

The search for food, exploratory behaviour and communication are activities based mainly on sight, which represents the most developed sense in birds (Güntürkün, 2000). The Directive 98/58/CE requires "light levels sufficient to allow all hens to see one another and be seen clearly, to investigate their surroundings visually and to show normal levels of activity"; this light level can be considered, based on recent studies, 20 lux (excluding rest and egg-laying activities, for which lower levels are preferable).

Prolonged exposure to low light levels (<10 lux) has been shown to cause eye injury and behavioural abnormalities (Prescott e Wathes 2002; Prescott et al., 2004). Even periods of prolonged light are dangerous for the welfare of the hen, not only from the physical point of view, but also behaviourally: uninterrupted light programs make animals more fearful (Campo e Davila, 2002).

It is therefore essential to ensure that animals have an artificial light cycle as close as possible to the natural one, with alternation of light and dark within 24 hours, which allows the hens to rest, reduce stress and encourage the circadian rhythm (Malleau et al., 2007).

Natural lighting exposes birds to all the light spectra to which they are receptive. If this type of light is used, the intensity of light and distribution of windows should try to minimize some problems such as: laying eggs on the floor, feather pecking and suffocation. In the barns, the openings should be shaded or darkened to prevent direct sunlight from entering, and structured so that the light is evenly distributed.

Another very important factor for the well-being of laying hens is the uniformity of light distribution: areas of intense light inside the shed can cause very serious pecking problems (ICFAW, 2017).

In artificial light systems there should be a sufficient twilight period before the dark hours, so that birds can identify the appropriate resting places without causing injury or disturbing the others. A twilight period between 15 and 30 minutes is considered appropriate. This system also determines the stimulation of feeding behaviour during the daytime and prevent hunger during the night. It is also important to have a period of gradual increase in light intensity before the lights are switched on, in order to reduce the amount of eggs laid on the floor (ICFAW, 2017).

The assessor could verify the adequacy of light program through the inspection of the control unit. It is recommended to measure the light intensity at animals' eye-level at least in 5 different locations, representative of the whole house (feeding, drinking areas and floor), not only to be able to monitor the light intensity within different points of the house, but also to assess the light distribution (EURCAW – Poultry – SFA, 2020).

# B.30 Sound level

*"The sound level shall be minimised. Constant or sudden noise shall be avoided. Ventilation fans, feeding machinery or other equipment shall be constructed, placed, operated and maintained in such a way that they cause the least possible noise."* (Directive 1999/74/EC, Annex, Paragraph 2)

| **Item 30**<br>**SOUND LEVEL**<br>*(Category of non compliance: Buildings and accommodation)* |
|---|
| *"The sound level shall be minimised. Constant or sudden noise shall be avoided. Ventilation fans, feeding machinery or other equipment shall be constructed, placed, operated and maintained in such a way that they cause the least possible noise."* |
| The sound level is loud |
| The sound level is low |

Bright and Johnson (2001) reported that laying hens can adapt to many levels and types of noise; despite this, the exposure to sudden and loud noise must be minimised, in order to prevent stress fear-induced and its consequences, like clumping.

The machinery must be designed, placed and maintained in order to minimise the noise level (Chlouplek *et al.*, 2009). The assessor should verify the evidence/absence of noise that can be stressful for the animals and can decrease hen's welfare.

# B.31 Daily water consumption

| **Item 31**<br>**DAILY WATER CONSUMPTION** |
|---|
| **Water consumption should be monitored daily with a meter, in order to point out promptly any abnormalities (that could be caused by pathologies or lack of animal welfare)** |
| Lack of water meter |
| One water meter for every shed |

Laying hens must have water available 24 hours a day.

The measurement of daily water consumption is a zootechnical parameter that, especially when compared with feed consumption, can provide a first indication of a possible welfare problems, especially when sudden changes occur. For example, in the case of unexpected temperature rises, which cause heat stress, animals markedly increase their water consumption. Disease states or nutritional imbalances can also lead to an alteration of normal water consumption.

It is impossible to establish a precise value for water demand, as need depends on the ambient temperature and relative humidity, the composition of the diet, the rate of egg production rate, etc. For example, laying hens may consume approximately 150 to 300 litres of water per 1000 animals, depending on the temperature; generally, the water intake is twice than the food intake (National Research Council, 1984). Therefore, is important to monitor daily water consumption through meters, which must respond to flow and pressure.

## B.32 Daily feed consumption

The measurement of feed consumption is another zootechnical parameter to be considered as a first general indication of a possible welfare problem, especially when there are rapid increases or decreases of feed consumption. For example, in conditions of high heat or severe feather pecking, in which the animals no longer have plumage capable of insulating them thermally, the increase in feed consumption may occur, as a compensatory phenomenon for the high heat loss (EFSA,2005).

The evaluator should ensure that at least manual measurements of feed consumption are carried out on the farm (e.g. checking the amount of feed removed from the silos per week). In the case of automatic measurements (e.g. control unit, silo weight control system and feed dosing) the judgement will be improved.

| Item 32<br>**DAILY FEED CONSUMPTION** |
|---|
| **Feed consumption should be monitored daily with a counter, in order to point out promptly any abnormalities (that could be caused by pathologies or lack of animal welfare)** |
| Lack of daily feed consumption measuring systems |
| Evidence of daily feed consumption measuring systems and manual recordings of feed consumption |
| Evidence of daily feed consumption measuring systems provided with automatic recordings of feed consumption (e.g. feed dispensing systems) |

# B.33 Nest (ENRICHED CAGES)

*"Nest means: a separate space for egg laying, the floor components of which may not include wire mesh that can come into contact with the birds, for an individual hen or for a group of hens (group nest);"* (Directive 1999/74/EC, Article 2.b)

*"Nesting areas shall not be regarded as usable areas."*(Directive 1999/74/EC, Article 2.d)

| Item 29<br>**NEST (ENRICHED CAGES)**<br>*(Category of non compliance: Buildings and accommodation)* |
|---|
| *""Nest means: a separate space for egg laying, the floor components of which may not include wire mesh that can come into contact with the birds, for an individual hen or for a group of hens (group nest);"*<br>*"Nesting areas shall not be regarded as usable areas."* |
| The nest is missing and/or unsuitable |
| The nest is present and adequate |
| The nest is present and well separated |

Birds have a high behavioural priority to lay their eggs in a nest site that is suitable to them and to perform nest building behaviour. Their preference is for an enclosed nest and a pre-moulded or mouldable substrate. Suitable nests, adequately distributed, should be provided in housing systems for laying hens (EFSA, 2015).

An adequate number of discrete enclosed individual or group nests should be provided. They should be placed so that birds can easily gain access to them. The ability to access nests may be affected by rearing and if the nests are raised off the ground then birds should be reared so that they learn to jump up to them. Nest box use should be managed to minimise competition, be accessible easily and be positioned optimally.

However, in order that hens can exhibit natural hatching behaviour without being disturbed, it is suggested to check, as a guideline, that at least 1 nest is present for every 5 hens. To assess the adequacy of the nest, the assessor can use the guidelines in Welfare Quality Protocol ®" (2019): it is necessary to observe that the nests are distributed in the available space and that the eggs are distributed in the collection bar in front of the perch.

Figure 4: Nest in enriched cages

# B.34 Litter quality (ENRICHED CAGES)

*"Laying hens must have: litter such that pecking and scratching are possible"* (Directive 1999/74/EC,Chapter III, Article 6, Paragraph 1.c).

| **Item 30**<br>**LITTER QUALITY (ENRICHED CAGES)**<br>*(Category of non compliance: Buildings and accommodation)* |
|---|
| *"Laying hens must have: litter such that pecking and scratching are possible"* |
| Litter is missing or inadequate |
| Litter is adequate |

Breeding in enriched cages presents structural and managerial peculiarities that make it impossible to have a traditional litter. The Directive 1999/74/EC defines litter as "*any friable material enabling the hens to satisfy their ethological needs*". What is actually provided to animals in almost all cases is a mat or a small rubber or plastic surface on which a small amount of feed can fall through a hole in the feeder. This feed represents a manipulable and scratchable material that animals can use. When hens don't have access to any material, these behaviours can be redirected towards the others, with episodes of feather pecking and aggressiveness. The assessor should evaluate the presence of an appropriate amount of manipulable material.

Figure 5: Litter in enriched cages

# B.35 Perches (ENRICHED CAGES)

*"Laying hens must have: appropriate perches allowing at least 15 cm per hen"* (Directive 1999/74/EC, Chapter III, Article 6, Paragraph 1.d).

| **Item 35**<br>**PERCHES (ENRICHED CAGES)**<br>*(Category of non compliance: Buildings and accommodation)* |
|---|
| *"Laying hens must have: appropriate perches allowing at least 15 cm per hen"*<br>**"Appropriate perches" means perches providing hens with a perception of elevation, designed so that they can reduce wounds and maximise the use** |
| No perches or not adequate perches (approximately width < 1,5 cm or >10,5 cm), not allowing at least 15 cm per hen |
| Appropriate perches (approximately width between 1,5 and 3 cm or between 6 and 10,5 cm) allowing at least 15 cm per hen |
| Appropriate perches (approximately width between 3 and 6 cm) allowing at least 15 cm per hen |

When in a natural state, hens frequently use perches, especially for perching at night. This behaviour derives from a primordial instinct to protect themselves from predators by resting in an elevated position. Furthermore, this behaviour, if performed by animals reared in intensive farming systems, seems to bring benefits in terms of foot health and bone strength.

The legislation only requires that the perches for the enriched cages must be "adequate". Whether and to what extent perches can be considered "adequate" depends on their characteristics, such as height, material and shape, width and transverse diameter, colour and their spatial arrangement in relation to other perches and to other structures inside the cages (EFSA,2015).

In order to ensure an adequate level of well-being, it is essential that perches guarantee stability to the hens during sitting and resting, therefore they should be non-slippery, wide enough and easily graspable (EFSA, 2015).

The choice of material is very important for the animal welfare, because it can have both positive (increasing the frequency of roosting and the rest period on the perch), and negative effects (increasing bone lesions, bumblefoot and hyperkeratosis): in fact, hard materials such as metal or plastic can be responsible for fractures or deformities in the sternal bone, while wood or rubber (as a covering) are preferred by animals (Chen et al., 2014), although they are more difficult to clean and disinfect.

The shape of perches does not seem to particularly affect the well-being of hens, although rounded ones are preferable.

Regarding the width of perches, EFSA (2015) reports that, within a range from 1.5 cm to 10.5 cm, well-being is still guaranteed, but 6 cm is preferable compared to 3 cm (suboptimal width) or 1.5 cm (inadequate width).

Considering the height of perches from the ground, it has been seen that when a hen jumps at a distance greater than 80 cm to reach or leave a perch (in any direction), or jumps with an inclination between 45 ° and 90 ° (measured with respect to the horizontal plane), the risk of a bad landing and injuries increases (EFSA, 2015). The distance between the perches and the upper part of the cage, the net or the ceiling of the shed must instead be more than 20 cm.

For enriched cages, current legislation requires a minimum of 15 cm of space on the perch per hen. However, the directive does not establish a minimum requirement for the height of the perch, nor the shape or diameter, allowing a wide variability in the interpretation of these aspects in the various countries.

Conformation and positioning of the perch are important to prevent the hens from crowding; for this reason, perches should not overhang areas covered with litter and should be far enough away from the walls to avoid disturbing or injuring animals.

The assessor should verify that the perch space available to each laying hen is sufficient and that the characteristics of the perch make it safe for animals and suitable for carrying out the natural behaviour.

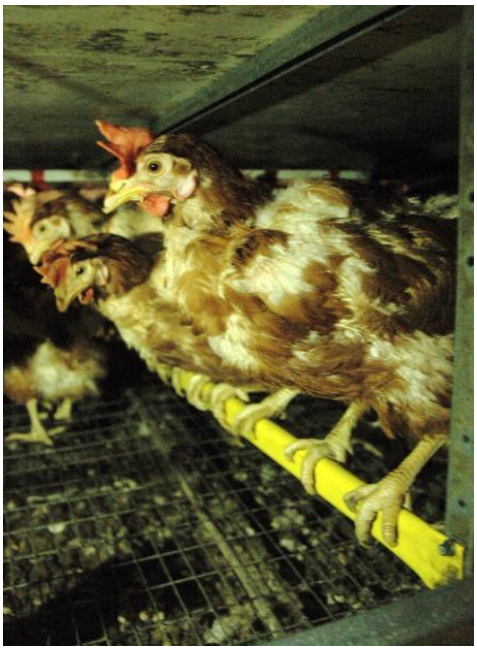


Figure 6: Perch in enriched cage

# B.36 Size of areas between tiers of cages and between floor and cages (ENRICHED CAGES)

*"To facilitate inspection, installation and depopulation of hens there must be a minimum aisle width of 90 cm between tiers of cages and a space of at least 35 cm must be allowed between the floor of the building and the bottom tier of cages;"* (Directive 1999/74/EC, Chapter III, Article 6, Paragraph 4).

| **Item 36**<br>**SIZE OF AREAS BETWEEN TIERS OF CAGES AND BETWEEN FLOOR AND CAGES (ENRICHED CAGES)**<br>*(Category of non compliance: Buildings and accommodation)* |
|---|
| *"To facilitate inspection, installation and depopulation of hens there must be a minimum aisle width of 90 cm between tiers of cages and a space of at least 35 cm must be allowed between the floor of the building and the bottom tier of cages;"* |
| Evidence of at least one not sufficient parameter |
| All parameters are sufficient |

To ensure a proper inspection and extraction of the birds, the workers should be able to move easily within the shed. For this reason, the rows of cages must be separated by a space having a minimum width of 90 cm. In addition, the cages in the lower row must not be directly in contact with the floor, but at a height of at least 35 cm.

# B.37 Claw-shortening devices (ENRICHED CAGES)

*"Cages must be fitted with suitable claw-shortening devices."* (Directive 1999/74 EC, Chapter III, Article 6, Paragraph 5).

| **Item 37**<br>**CLAW-SHORTENING DEVICES (ENRICHED CAGES)**<br>*(Category of non-compliance: Buildings and accommodation)* |
|---|
| *"Cages must be fitted with suitable claw-shortening devices."* |

| **To avoid an excessive claw growth, which could lead to claw rupture or could be a risk for the other hens inside the same cage, cages must be fitted with suitable claw-shortening devices. The assessor should evaluate the suitability and efficacy of these devices by checking directly on the animals if there are some broken or too long claws.** |
|---|
| Claw-shortening devices are missing or inadequate |
| Claw-shortening devices are present and adequate |

The law states that nail shortening devices must be present only in enriched cages breeding systems. These devices are essential for the well-being of laying hens, as excessive growth of the nails can lead to their breaking or falling, with injury to the animal itself, and scratches and injuries to other animals or to the operators who handle them.

As reported by EFSA (2005), there are different types of nail shortening devices currently in use, all generally positioned behind the feeders: perforated panels made of different materials, such as ceramic or metal, or abrasive pastes and strips.

The success of these devices depends both on the effectiveness of the material and on the genetics of the hens themselves; for example, in brown hens too abrasive devices can cause the weakening of the nails, while in white hens, characterized by a fast and massive growth of the nails, it is useful to adopt a very abrasive device.

The assessor should check the presence of devices for the shortening of the nails inside the cages and then prove their adequacy by observing the nails of the animals in several cages and highlighting those that are broken or excessively long; the final judgment derives from an overall evaluation.

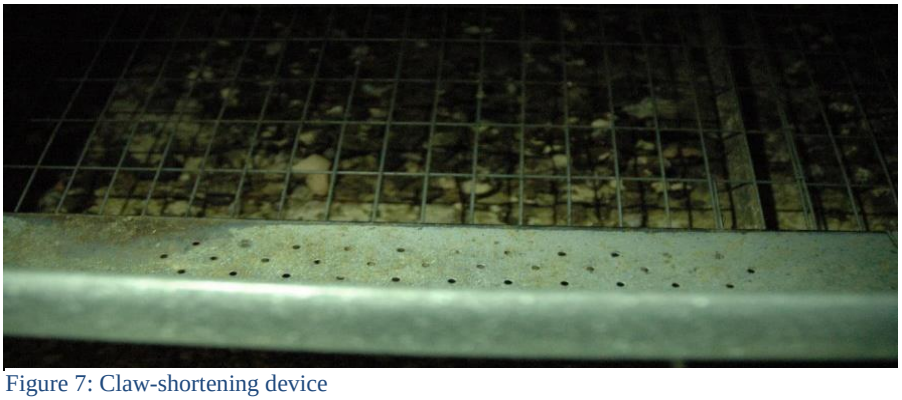


Figure 7: Claw-shortening device

# B.38 Nest (ALTERNATIVE SYSTEMS)

*"All systems must be equipped in such a way that all laying hens have: at least one nest for every seven hens. If group nests are used, there must be at least 1 m2 of nest space for a maximum of 120 hens;"* (Directive 1999/74 EC, Chapter I, Article 4, Paragraph 1.c).

| **Item 38**<br>**NEST (ALTERNATIVE SYSTEMS)**<br>*(Category of non-compliance: Buildings and accomodation)* |
|---|
| *"All systems must be equipped in such a way that all laying hens have: at least one nest for every seven hens. If group nests are used, there must be at least 1 m2 of nest space for a maximum of 120 hens;"* |
| Number/size of nests not sufficient |
| All parameters are sufficient |
| There is at least 1 nest for 5 hens or 1m2 of nest space for less than 120 hens |

Figure 8: Single (left) and group (right) nests

The inability to express laying behaviour represents a great source of stress for laying hens raised with intensive methods. This behaviour is triggered in the animals by changes in hormone levels; as a result of these endocrine changes, hens tend to isolate themselves in a secluded place to lay eggs.

For this reason, the legislator deemed it necessary to provide for an area destined to nest in each of the farming systems. This structure must be secluded and protected, and there must be an appropriate number based on the consistency of the group of animals. In fact, an insufficient number of nests can lead the animals to pile up with consequent injuries (up to death by suffocation).

In the context of alternative breeding systems, the nests can be individual or group nests (also called "family nests"). The former, by law, must be a maximum of 1 for every 7 hens, while the latter, which can have only one opening or numerous openings that allow access to a larger surface, must be covered on at least two sides. The ideal situation for the welfare of the laying hen is when the individual nests are not less than 1 for 5 hens or when the group nests are covered on all four sides with front curtains and possibly located in the centre of the shed.

# B.39 Perches (ALTERNATIVE SYSTEMS)

*"All systems must be equipped in such a way that all laying hens have: adequate perches, without sharp edges and providing at least 15 cm per hen. Perches must not be mounted above the litter and the horizontal distance between perches must be at least 30 cm and the horizontal distance between the perch and the wall must be at least 20 cm;"* (Directive 1999/74 EC, Chapter I, Article 4, Paragraph 1.d).

| **Item 39**<br>**PERCHES (ALTERNATIVE SYSTEMS)**<br>*(Category of non-compliance: Buildings and accommodation)* |
|---|
| *"All systems must be equipped in such a way that all laying hens have:*<br>*adequate perches, without sharp edges and providing at least 15 cm per hen. Perches must not be mounted above the litter and the horizontal distance between perches must be at least 30 cm and the horizontal distance between the perch and the wall must be at least 20 cm;"*<br>**"Appropriate perches" means perches providing hens with a perception of elevation, designed so that they can reduce wounds and maximise the use** |
| No perches or not adequate perches (approximately width < 1,5 cm or > 10,5 cm), not allowing at least 15 cm per hen |
| Appropriate perches (approximately width between 1,5 and 3 cm or between 6 and 10,5 cm) allowing at least 15 cm per hen |
| Appropriate perches (approximately width between 3 and 6 cm) allowing at least 15 cm per hen |

Wild hens frequently use perches, especially for perching at night. This behaviour derives from a primordial instinct to protect themselves from predators by placing themselves in an elevated position.

In addition to an ethological advantage, this attitude, if taken by intensively bred animals, would seem to bring benefits in terms of foot health and increase in bone strength.

The legislation prescribes that the perches are adequate, without sharp edges and that there is at least 15 cm of space for each layer. Providing 15 cm of raised perch has been shown to reduce fear and aggression of animals and improve body condition. For alternative systems, it is preferable to have more than 15 cm of space per hen, since there is more competition between animals than the modified cages.

The conformation and positioning of the perch are important to prevent the hens from crowding, which can lead to problems descending from the perch and consequent injuries. For this reason, the perches must not overhang the areas covered by litter and must be at least 30 cm from each other and at least 20 cm from the walls.

Perches made of soft materials (e.g. soft wood) or covered with rubber and those with a round section rather than those with a rectangular section are preferable. EFSA (2015) recommends a perch width between 3 and 6 cm to ensure the comfort of the foot and of the plantar pad in particular.

The assessor must verify that the perch space available to each laying hen is sufficient and that the characteristics of the perch itself make it safe for animals and suitable for carrying out the natural behaviour of perching.

Figure 9: Perching hen

# B.40 Litter (ALTERNATIVE SYSTEMS)

*"All systems must be equipped in such a way that all laying hens have: at least 250 cm2 of littered area per hen, the litter occupying at least one third of the ground surface."* (Directive 1999/74 EC, Chapter I, Article 4, Paragraph 1.e).

| **Item 40**<br>**LITTER (ALTERNATIVE SYSTEMS)**<br>*(Category of non-compliance: Buildings and accommodation)* |
|---|
| *"All systems must be equipped in such a way that all laying hens have: at least 250 cm2 of littered area per hen, the litter occupying at least one third of the ground surface."* |
| Littered area is less than 250cm² per hen and/or is occupying less than one third of the ground surface |
| Littered area is at least 250cm² per hen and/or is occupying at least one third of the ground surface |
| The litter area is more than 500 cm²/hive and occupies at least half of the floor area |

The presence of litter in the laying hen farm is essential for the animals to express species-specific behaviours such as: dust-bathing, dusting and pecking. When the animals do not have access to any litter (or when the conditions of the litter are very poor), these behaviours can be redirected towards the conspecific, with attitudes of aggression and feather-pecking. For this reason it is important, for the sake of laying hens, that the litter is present and kept in good conditions of friability.

The European Directive establishes that for each layer there is a litter area of at least 250 cm² and that it occupies at least a third of the surface on the ground.

The assessor must verify that the litter surface present is adequate with respect to the number of animals, and covered by a sufficient layer of scratchable and crumbly material.

Figure 10: Hens on litter in aviary systems

# B.41 Flooring (ALTERNATIVE SYSTEMS)

*"The floors of installations must be constructed so as to support adequately each of the forward-facing claws of each foot."* (Directive 1999/74 EC, Chapter I, Article 4, Paragraph 2).

| **Item 41**<br>**FLOORING (ALTERNATIVE SYSTEMS)**<br>*(Category of non-compliance: Buildings and accommodation)* |
|---|
| *"The floors of installations must be constructed so as to support adequately each of the forward-facing claws of each foot."* |
| The floors don't support adequately each of the forward-facing claws of each foot |
| The floors support adequately each of the forward-facing claws of each foot |

The evaluator should consider whether the size of the floor gaps is adequate in size, considering the size of hens' legs. The floor should allow the passage of the dejections below the walkable surface, and adequately support the front nails of the hens.

Figure 11: Grated flooring

# B.42 Number of overlapping levels (ALTERNATIVE SYSTEMS AVIARIES)

*"If systems of rearing are used where the laying hens can move freely between different levels, (i) there shall be no more than four levels"* (Directive 1999/74 EC, Chapter I, Article 4, Paragraph 3.a.i).

| **Item 42**<br>**NUMBER OF OVERLAPPING LEVELS (ALTERNATIVE SYSTEMS AVIARIES)**<br>*(Category of non-compliance: Buildings and accommodation)* |
|---|
| *"If systems of rearing are used where the laying hens can move freely between different levels, (i) there shall be no more than four levels"* |
| Aviaries with a number of overlapping levels equal to or greater than 5 |
| Aviaries with a number of overlapping levels equal to or lower than 4 |

The aviary systems could have different levels of perforated flooring (in wire mesh or plastic). The platforms are often connected to each other via ramps or stairs. The ground surface is partially or totally covered with litter. Usually the nests are all located on the same level, along the entire length of the shed, while the feeding and drinking devices are evenly distributed over several levels. Sometimes these structures are not installed on the upper floors, as the hens tend to take refuge on the upper levels to rest during the night.

This breeding system creates a high degree of complexity of the environment, and stimulates the exercise and exploratory behaviour of the hens.

To ensure good management of multi-level breeding systems (especially as regards the disposal of manure), the legislation establishes that the maximum number of overlapping levels is four; the assessor must, with possibly the aid of the breeding plan, verify that this requirement is met.

# B.43 Headroom between levels (ALTERNATIVE SYSTEMS AVIARIES)

*"If systems of rearing are used where the laying hens can move freely between different levels [...] (ii) the headroom between the levels must be at least 45 cm"* (Directive 1999/74 EC, Chapter I, Article 4, Paragraph 3.a.ii).

| **Item 43**<br>**HEADROOM BETWEEN LEVELS (ALTERNATIVE SYSTEMS AVIARIES)**<br>*(Category of non-compliance: Buildings and accommodation)* |
|---|
| *"If systems of rearing are used where the laying hens can move freely between different levels [...] (ii) the headroom between the levels must be at least 45 cm"* |
| Aviary with an headroom shorter than 45 cm |
| Aviary with an headroom equal or higher than 45 cm |

The minimum height provided for each level is 45 cm, which allows the animals to stand upright or on perches. However, according to some studies, this height does not allow to carry out some typical movements of the species, such as: extension of the head, flapping of the wings and shaking of the bust. The ability to perform these movements would lead the animals to greater bone strength. Some authors report that, if possible, hens use up to 56 cm of height space.

# B.44 Feeders and drinkers (ALTERNATIVE SYSTEMS AVIARIES)

*"If systems of rearing are used where the laying hens can move freely between different levels, (iii) the drinking and feeding facilities must be distributed in such a way as to provide equal access for all hens"* (Directive 1999/74 EC, Chapter I, Article 4, Paragraph 3.a.iii).

| **Item 44**<br>**FEEDERS AND DRINKERS (ALTERNATIVE SYSTEMS AVIARIES)**<br>*(Category of non-compliance: Buildings and accommodation)* |
|---|
| *"If systems of rearing are used where the laying hens can move freely between different levels, (iii) the drinking and feeding facilities must be distributed in such a way as to provide equal access for all hens"* |
| Equal access is not provided to feeders and drinkers for all hens |
| Equal access is provided to feeders and drinkers for all hens |

Feeding and drinking devices may be present on all floors or only on some of them, but it is important that each hen has easy access to food and water at any level. Sometimes it is preferred to leave only the last level without these devices, since it has been seen that the animals tend to reach the higher floors to rest during the night.

Therefore, both farms that have feeders and drinkers on each floor and those that do not have these structures on the top floor (if they are uniformly distributed in the remaining floors) will comply to the requirement.

# B.45 Protection from falling of droppings (ALTERNATIVE SYSTEMS AVIARIES)

*"If systems of rearing are used where the laying hens can move freely between different levels,*
*(iv) the levels must be so arranged as to prevent droppings falling on the levels below."* (Directive 1999/74 EC, Chapter I, Article 4, Paragraph 3.).

| **Item 45**<br>**PROTECTION FROM FALLING OF DROPPINGS (ALTERNATIVE SYSTEMS AVIARIES)**<br>*(Category of non-compliance: Buildings and accommodation)* |
|---|
| *"If systems of rearing are used where the laying hens can move freely between different levels,*<br>*(iv) the levels must be so arranged as to prevent droppings falling on the levels below."* |
| Aviaries which systems don't prevent droppings falling on the levels below |
| Aviaries which systems prevent droppings falling on the levels below |

The levels of the aviary can be arranged in a staggered way, so that the manure falls into an underlying space free of animals, or a manure removal device can be present under each floor.
The assessor must observe the arrangement of the aviary system plans and can observe the general cleanliness of the animals to understand if the requirement is met.

# B.46 Size of pop holes (ALTERNATIVE SYSTEMS FREE RANGE)

*"If laying hens have access to open runs:*
*(i) there must be several pop-holes giving direct access to the outer area, at least 35 cm high and 40 cm wide and extending along the entire length of the building; in any case, a total opening of 2 m must be available per group of 1 000 hens"* (Directive 1999/74 EC, Chapter I, Article 4, Paragraph 3.b.i)

| **Item 46**<br><br>**SIZE OF POP HOLES (ALTERNATIVE SYSTEMS FREE RANGE)**<br>*(Category of non-compliance: Buildings and accommodation)* |
|---|
| *"If laying hens have access to open runs:(i) there must be several pop-holes giving direct access to the outer area, at least 35 cm high and 40 cm wide and extending along the entire length of the building; in any case, a total opening of 2 m must be available per group of 1 000 hens"* |
| Evidence of at least one not sufficient parameter |
| All parameters are sufficient |

In case of access to an external space, it must be guaranteed in equal measure to each animal, wherever it is located in the shed. The openings must then be of such size that they do not hinder the exit of the hens or injure them during the passage.

# B.47 Outer space availability (ALTERNATIVE SYSTEMS FREE RANGE)

*"open runs must be:*

*— of an area appropriate to the stocking density and to the nature of the ground, in order to prevent any contamination;"* (Directive 1999/74, Chapter I, Paragraph 3.b.ii)

*"The maximum stocking density of open-air runs must not be greater than 2 500 hens per hectare of ground available to the hens or one hen per 4 m2 at all times. However, where at least 10 m2 per hen is available and where rotation is practised and hens are given even access to the whole area over the flock's life, each paddock used must at any time assure at least 2,5 m2 per hen"* (Commission Delegated Regulation (EU) 2017/2168 Annex, Paragraph 1.c)

| **Item 47**<br>**OUTER SPACE AVAILABILITY (ALTERNATIVE SYSTEMS FREE RANGE)**<br>*(Category of non-compliance: Buildings and accommodation)* |
|---|
| *"The maximum stocking density of open-air runs must not be greater than 2 500 hens per hectare of ground available to the hens or one hen per 4 m2 at all times. However, where at least 10 m2 per hen is available and where rotation is practised and hens are given even access to the whole area over the flock's life, each paddock used must at any time assure at least 2,5 m2 per hen"* |
| The outer surface does not guarantee the correct density of animals |
| The outer surface ensures the correct density of animals |

The assessor must calculate, by examining the plan of the farm and knowledge of the number of animals housed, if the external surface intended for laying hens is sufficient and meets the regulatory requirement.

# B.48 Outdoor shelters (ALTERNATIVE SYSTEMS FREE RANGE)

*"Animals not kept in buildings shall where necessary and possible be given protection from adverse weather conditions, predators and risks to their health.*" (Directive 98/58/CE, Annex, Paragraph 12)

*"open runs must be:*

*[...] equipped with shelter from inclement weather and predators and, if necessary, appropriate drinking troughs"* (Directive 1999/74, Chapter I, Paragraph 3.b.2).

*"open-air runs must not extend beyond a radius of 150 m from the nearest pop-hole of the building. However, an extension of up to 350 m from the nearest pop-hole of the building is permissible provided that a sufficient number of shelters as referred to in Article 4(1)(3)(b)(ii) of Directive 1999/74/EC are evenly distributed throughout the whole open-air run with at least four shelters per hectare.*" (Commission Delegated Regulation (EU) 2017/2168 Annex, Paragraph 1.d)

| **Item 48**<br>**OUTDOOR SHELTERS (ALTERNATIVE SYSTEMS FREE RANGE)**<br>*(Category of non-compliance: Buildings and accommodation)* |
|---|
| *"open runs must be: [...] equipped with shelter from inclement weather and predators and, if necessary, appropriate drinking troughs"*<br>*"open-air runs must not extend beyond a radius of 150 m from the nearest pop-hole of the building. However, an extension of up to 350 m from the nearest pop-hole of the building is permissible provided that a sufficient number of shelters as referred to in Article 4(1)(3)(b)(ii) of Directive 1999/74/EC are evenly distributed throughout the whole open-air run with at least four shelters per hectare."* |
| Evidence of at least one not sufficient parameter |
| All parameters are sufficient |

The outdoor space must be properly managed to encourage hens to make full use of it. In fact, they manifest an attitude of fear (towards possible predators), which can be mitigated by the presence of shelters under which they can hide. Therefore, to encourage the use of outdoor areas, it is necessary to provide them with shelters and shaded areas (both natural and artificial).

However, predators do indeed pose a risk for raised hens; it is therefore important to take appropriate measures to protect them (for example, a fence against predators from the ground or a net suspended above animals in certain areas against large birds of prey).
The assessor must verify the presence and suitability for the protection from predators of the shelters provided by the breeder, and if the drinkers are present in an adequate number and evenly distributed.

# B.49 Further use of open runs (ALTERNATIVE SYSTEMS FREE RANGE)

*"Open-air runs to which hens have access must be mainly covered with vegetation and not be used for other purposes except for orchards, woodland and livestock grazing if the latter is authorised by the competent authorities"* (Commission Delegated Regulation (EU) 2017/2168 Annex, Paragraph 1.b)

| **Item 49**<br><br>**FURTHER USE OF OPEN RUNS (ALTERNATIVE SYSTEMS FREE RANGE)**<br>*(Category of non-compliance: Buildings and accommodation)* |
|---|
| *"Open-air runs to which hens have access must be mainly covered with vegetation and not be used for other purposes except for orchards, woodland and livestock grazing if the latter is authorised by the competent authorities"* |
| Open runs unfit for rearing |
| Open runs fit for rearing |

To stimulate the use of the outdoor space by the hens, it must be covered mainly with vegetation (which should not be excessively dense in order to not hinder the movement of the animals). This space can be used simultaneously for agricultural purposes but exclusively as an orchard, woodland or livestock grazing.

# B.50 Environmental enrichments (ALTERNATIVE SYSTEMS)

| **Items 50**<br><br>**ENVIRONMENT ENRICHMENTS (ALTERNATIVE SYSTEMS)**<br>*(Category of non-compliance: Buildings and accommodation)* |
|---|
| *Sources of environmental enrichment, such as substrates that stimulate and satisfy pecking behaviour in search of food, should be equally distributed and accessible to the animals. For example, straw balls, mineral pecking blocks of alfalfa are effective materials that hens are happy to use. Using the right environmental enrichments will help prevent plumofagia and cannibalism* |
| Enrichments not provided |
| A suitable and well-distributed enrichment is provided for every 2,000 animals |
| Two or more different and well-distributed suitable enrichments are provided per 2,000 animals |

In recent years, particular attention has been paid to environmental enrichment of laying hens with the recourse to more complex rearing systems (enriched cages, aviaries, free range and free-range rearing). Such systems are able to guarantee the fulfilment of basic behavioural needs (roosting, nesting, sand bathing). The provision of additional sources of environmental enrichment has proven to have a positive effect on the welfare of laying hens.

# AREA C. Animal-based measures

Through the analysis of managerial and structural factors, the main animal welfare hazards present on laying hen farms were analysed. The currently regulations in force on the protection of animals on farm don't provide for the direct observation of the animal, but rather the evaluation of the environment in which it lives and the management practices to which it is subjected. However, over the last 20 years the study of animal welfare has focused mainly on the evaluation of the animal and less on the environmental conditions in which it lives. Between the living conditions and the welfare of the animal, the ability of the animal to adapt to the environment is interposed. Therefore, it's important to combine the assessment of risk factors with the observation of the consequences (adverse effects) that these have on the animal. The analysis of adverse effects is possible through the evaluation of welfare indicators (animal-based measures - ABMs) that can be measured directly on the animal or indirectly, through the collection of data available on the farm, and for which a correlation has been scientifically demonstrated.

The animal that is not in a state of welfare, manifests precise physical signs that can be interpreted and evaluated in order to understand the state of distress.

ABMs do not have a meaning aimed to identifying specifically the pathology, but they are a tool for detecting the distress animal state.

# C.51 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"* (Directive 98/58 CE, Annex, Paragraph 19).

*"Without prejudice to the provisions of point 19 of the Annex to Directive 98/58/EC, all mutilation shall be prohibited. In order to prevent feather pecking and cannibalism, however, the Member States may authorise beak trimming provided it is carried out by qualified staff on chickens that are less than 10 days old and intended for laying"* (Directive 1999/74 EC, Annex, Paragraph 8).

| **Item 51**<br>**MUTILATIONS**<br>*(Category of non-compliance: 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."*<br>*"Without prejudice to the provisions of point 19 of the Annex to Directive 98/58/EC, all mutilation shall be prohibited. In order to prevent feather pecking and cannibalism, however, the Member States may authorise beak trimming provided it is carried out by qualified staff on chickens that are less than 10 days old and intended for laying."* |
| At least one hen with prohibited mutilations or permitted mutilations which don't meet the requirements |
| Hens with permitted mutilations |
| All animals are intact without mutilations |

Laying hens showing mutilations in the absence of documentation prepared by the veterinarian that, under his own responsibility, justifies this measure, represent a non-compliance to the law requirements. Beak trimming is prohibited, unless performed in the first days of life by qualified personnel and only with the use of equipment that minimizes the suffering of the animals. Although the absence of any form of mutilation performed on animals is preferable, sometimes they may also be necessary in order to

protect the layers: interventions such as the cutting off of the beak can in fact reduce the incidence of plumophagy and cannibalism and they are therefore to be considered acceptable. The currently most used methods are: i) hot blade; ii) infrared, widely used in supply chains; iii) laser.

For a correct debeaking, it is important to follow the following precautions (Hy-Line Brown Guidelines, 2016):

- do not cut the beak of sick chicks;
- do not rush;
- administer vitamins and electrolytes with vitamin K in the drinking water 2 days before and 2 days after cutting;
- check on the chicks that have been mutilated and increase the temperature to help the full recovery of the treated chicks;
- handle the chicks with care;
- increase the quantity of feed supplied in the days following the cut;
- use nipple drinkers with 360 ° activation.

# C.52 Average weekly mortality

| **Item 52**<br>**AVERAGE WEEKLY MORTALITY**<br>*(Category of non-compliance: Mutilations)* |
|---|
| **The average weekly mortality is obtained by summing the weekly mortalities divided by the number of weeks since housing. The weekly mortality is defined as the number of deaths (including culls) recorded during a week, divided by the number of animals present on the previous seventh day, expressed as a percentage. It is equivalent to using the most recent cumulative mortality figure to divide by the number of weeks since housing. The data is reliable if evaluated on a production cycle that has exceeded at least the 45th week since housing the pullets, otherwise the average weekly mortality figure of the previous cycle is also considered.** |
| Average weekly mortality rate higher than 0,2% |
| Average weekly mortality rate between 0,1% and 0,2% |

| |
|---|
| Average weekly mortality rate lower than 0,1% |

Mortality is an indirect ABM parameter that can assess the effectiveness of management and hygiene practices implemented on the farm. Dead animals on farms are, in fact, the extreme consequence of poor animal welfare conditions, serious health problems and errors in their management.

The mortality rate, expressed as a percentage and understood as the number of dead animals in a given period compared to the number of animals present at the beginning of that period, is thus the main indicator (also called iceberg indicator) of animal welfare.

The WOAH (2021) recognises that any unexpected increase in mortality could reflect a problem of animal welfare.

It is not easy to set threshold values of acceptability (standard/physiological mortality) in a rearing of laying hens as there are many variables, from genetics to different rearing systems (especially with outdoor access) and beak integrity.

Numerous studies have shown that the adoption of alternative rearing systems was initially accompanied by an increase in breeding mortality, which has gradually reduced over the years with the refinement and updating of rearing techniques.

Schuck- Paim and colleagues (2021) carried out an extensive meta-analysis on the mortality of laying hens in different systems, showing that mortality decreases with increasing experience in the management of the specific type of rearing.

In addition, the mortality has much variability in relation to the stage and week of the breeding cycle, and must therefore be evaluated over a period of several weeks.

Therefore, for assessing the welfare of laying hens, inspector have to consider the average weekly mortality prior to the day of inspection, from the farm mortality records.

The data can be obtained from the mortalities calculated for each week of breeding divided by the number of animals present on the previous seventh day.

Given the considerable variability due to the phase of the cycle, the mortality figure is considered reliable if assessed on a production cycle that has exceeded at least 45 weeks of the current production cycle.

Otherwise, if the inspection is conducted before week 45 of the current production cycle, inspector must consider the average weekly mortality data of the previous cycle.

# AREA MAJOR RISKS AND ALARM SYSTEMS

This area considers certain environmental factors that, in themselves, do not affect animal welfare but, in the event of a major hazard situation (e.g. water or electrical faults), could make a difference in safeguarding health and welfare of the animals.

## MAJOR RISKS. 53 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 CE, Annex, Paragraph 3).

| **Item 53**<br>**LIGHTING AVAILABLE FOR INSPECTION**<br>*(Category of non-compliance: Inspection)* |
|---|
| *"Adequate lighting (fixed or portable) shall be available to enable the animals to be thoroughly inspected at any time."* |
| Lack of adequate lighting (fixed or portable) available for inspection |
| Presence of adequate lighting (fixed or portable) available for inspection |

The daily inspection of the 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, inspections conducted by official veterinarians or private certification bodies must have adequate lighting for their purposes. The light intensity and duration of the light period should allow operators to adequately inspect all animals throughout the day. In addition, fixed or mobile lighting should be present to allow inspection of the animals at any time, even at night, so that workers can intervene promptly.

# MAJOR RISKS. 54 Inspection of automated and mechanical equipment

# MAJOR RISKS. 55 Alarm System

# MAJOR RISKS. 56 Presence of a backup system (ventilation)

*"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.*

*Where the health and well-being of the animals is dependent on an artificial ventilation system, provision must be made for an appropriate backup system to guarantee sufficient air renewal to preserve the health and well-being of the animals in the event of failure of the system, and an alarm system must be provided to give warning of breakdown. The alarm system must be tested regularly"* (Directive 98/58 CE, Annex, Paragraph 13).

| **Item 54**<br>**INSPECTION OF AUTOMATED AND MECHANICAL EQUIPMENT**<br>*(Category of non-compliance: Automatic or mechanical equipment)* |
|---|
| *"All automated or mechanical equipment essential for the health and well-being of the animals must be inspected at least once daily."* |
| Automated and mechanical equipment are inspected less than once daily |
| Automated and mechanical equipment are inspected at least once daily |
| Automated and mechanical equipment are inspected 1 or more times a day and presence of a documented plan of emergencies |

| **Item 55** |
|---|
| **ALARM SYSTEM**<br>*(Category of non-compliance: Automatic or mechanical equipment)* |
| *"In the event of failure of the [ artificial ventilation] system an alarm system must be provided to give warning of breakdown. The alarm system must be tested regularly".*<br>**The best judgement can be assigned in case of a multifunctional alarm system, regarding not only the ventilation system but also other devices essential for the health and well-being of the animals (e.g drinking and feeding systems)** |
| Lack of an alarm system for the artificial ventilation equipment |
| Presence of an alarm system for the ventilation equipment, regularly monitored |
| 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 |

| **Item 56** |
|---|
| **PRESENCE OF A BACKUP SYSTEM (VENTILATION)**<br>*(Category of non-compliance: Automatic or mechanical equipment)* |
| *"Where the health and well-being of the animals is dependent on an artificial ventilation system, provision must be made for an appropriate backup system to guarantee sufficient air renewal to preserve the health and well-being of the animals."*<br>**The best judgement can be assigned in case of a documented plan about managing emergency situation or accidents that can threat the health and well-being of the animals (e.g. failure of artificial ventilation system), as described in the Guides of good practice** |
| Lack/unsuitability of the backup system, in case of artificial ventilation |
| Presence of an appropriate backup system |
| Presence of an additional and formal emergency plan |

Automatic installations that may affect animal welfare (automatic feeding systems ventilation, etc.) must be checked daily and maintained regularly to ensure their proper functioning.

Where such installations are critical to animal welfare, they must be equipped with alarm systems, which in turn must be checked for effectiveness, in order to signal the presence of faults or malfunctions in time.

# MAJOR RISKS. 57 Presence of a current source

*"Back-up equipment, such as a generator, should be available for use in cases of emergency'* (RSPCA, 2017)

| **Item 57**<br>**PRESENCE OF A CURRENT SOURCE**<br>*(Category of non-compliance: Automatic or mechanical equipment)* |
|---|
| **A corrent source must be available to provide for all electric equipment essential for the well-being of laying hens in case of lack of electricity** |
| Lack of current source/Not working |
| Presence of a working current source |
| Presence of a working current source, provided with documents certifying regular inspections |

The assessor must verify that the company has a power generator to ensure the functionality of automatic and mechanical systems, if the failure is due to the absence of power.

# MAJOR RISKS. 58 Water supply system

*"Provision must be made for water supply even in freezing conditions."* (RSPCA, 2017)

| **Item 58**<br>**INSPECTION OF AUTOMATED AND MECHANICAL EQUIPMENT**<br>*(Category of non-compliance: Automatic or mechanical equipment)* |
|---|
| **Provisions should be adopted to ensure a water supply in case of emergency (e.g. lack of the regular supply)** |
| Lack of a water supply system |
| Presence of temporary solutions to ensure water supply (e.g.tanker) |
| Opportunity to draw water from the aqueduct or presence of alternative source |

Automatic systems that can influence animal welfare (automatic feeding, ventilation systems, etc.) must be subjected to daily checks and regular maintenance to ensure their proper functioning.

If these systems are essential for animal welfare, they must be equipped with alarm systems, which in turn must be checked to verify their effectiveness, in order to promptly report the presence of faults or malfunctions.

# MAJOR RISKS. 59 Medication Record

*"The owner or keeper of the animals shall maintain a record of any medicinal treatment given [...]. Where equivalent information is required to be kept for other purposes, this shall also suffice for the purposes of this Directive. 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"* (Directive 98/58 CE, Annex, Paragraphs 5-6).

| **Item 59**<br>**MEDICATION RECORD**<br>*(Category of non-compliance: Record keeping)* |
|---|
| *"The owner or keeper of the animals shall maintain a record of any medicinal treatment given [...]. Where equivalent information is required to be kept for other purposes, this shall also suffice for the purposes of this Directive. 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"* |
| The medication record is missing and/or the medication record hasn't been kept for the given period and/or is not correctly completed |
| Presence of the medication record, well maintained and correctly completed |

# MAJOR RISKS. 60 Mortality Record

*"The owner or keeper of the animals shall maintain a record of the number of mortalities found to each inspection"*

*"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*" (Directive 98/58 CE, Annex, Paragraphs 5-6)

| **Item 60** |
|---|
| **MORTALITY RECORD**<br>*(Category of non-compliance: Record keeping)* |
| *"The owner or keeper of the animals shall maintain a record of the number of mortalities found to each inspection"*<br>*"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"* |
| The mortality record is missing and/or the mortality record hasn't been kept for the given period and/or is not correctly completed |
| Presence of the mortality record, well maintained, kept for the given period and correctly completed |

# MAJOR RISKS. 61 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).

| **Item 61** |
|---|
| **ADMINISTRATION OF ILLEGAL SUBSTANCES**<br>*(Category of non-compliance: 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."* |
| Administration of illegal substances |
| No illegal substances administered |

# LEGAL REFERENCES

- Council Directive 98/58/EC of 20 July 1998 concerning the protection of animals kept for farming purposes;
- Council Directive 1999/74/EC of 19 July 1999 laying down minimum standards for the protection of laying hens;
- Commission Directive 2002/4/EC of 30 January 2002 on the registration of establishments keeping laying hens, covered by Council Directive 1999/74/EC;
- Directive 2003/74/EC of the European Parliament and of the Council of 22 September 2003 amending Council Directive 96/22/EC concerning the prohibition on the use in stock farming of certain substances having a hormonal or thyrostatic action and of beta-agonists;
- Directive 2004/28/EC of the European Parliament and of the Council of 31 March 2004 amending Directive 2001/82/EC on the Community code relating to veterinary medicinal products;
- Council Directive 96/22/EC of 29 April 1996 concerning the prohibition on the use in stock farming of certain substances having a hormonal or thyrostatic action and of ß-agonists, and repealing Directives 81/602/EEC, 88/146/EEC and 88/299/EEC;
- Commission Delegated Regulation (EU) 2017/2168 of 20 September 2017 amending Regulation (EC) No 589/2008 as regards marketing standards for free range eggs where hens' access to open air runs is restricted;
- Commission Regulation (EC) No 589/2008 of 23 June 2008 laying down detailed rules for implementing Council Regulation (EC) No 1234/2007 as regards marketing standards for eggs;
- Regulation (EU) 2016/429 of the European Parliament and of the Council of 9 March 2016 on transmissible animal diseases and amending and repealing certain acts in the area of animal health (‘Animal Health Law’);
- Council Regulation (EC) No 1099/2009 of 24 September 2009 on the protection of animals at the time of killing;

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