

## EVENT REPORT

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# The use of animal-based measures at slaughter for assessing the welfare of laying hen on farm: scientific NCPs Network exercise

European Food Safety Authority

## Abstract

The Network of the National Contact Points for scientific support under Art 20 of Council Regulation (EC) 1099/2009 on the protection of the animals at the time of killing (scientific NCPs Network) includes nationally appointed representatives of Member States, including EFTA Countries. At the annual scientific NCPs Network meeting held in October 2021, an exercise was set up to collect information from Network members on the use of animal-based measures (ABMs) at slaughter to assess welfare in the farms of laying hens. In preparation for the meeting, participants were asked to submit an online questionnaire to collect information on the use of such ABMs in the various European countries. Among the information, the ease of use, and the relationship of the ABMs with one or more welfare consequences were collected. During the meeting, the exercise continued with discussion and further elaboration of the information submitted. Meeting participants were asked to express their opinion by voting on the reliability of post-mortem ABMs to on-farm welfare conditions, on feasibility of assessing the ABMs at slaughter, and on which ABMs to prioritize. The exercise was held for the assessment of ABMs during *ante-mortem* and *post-mortem* inspections and, as a result of this exercise, informative lists of the most promising ABMs to be used at slaughterhouses to monitor the welfare of laying hens in the farm were produced.

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**Key words:** laying hens, animal-based measures, slaughter, welfare assessment, on-farm welfare, *ante-mortem* and *post-mortem* inspections.

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## 1. Introduction

The new Farm to Fork (F2F) strategy was published on 20 May 2020 ([https://ec.europa.eu/food/sites/food/files/safety/docs/f2f\\_action-plan\\_2020\\_strategy-info\\_en.pdf](https://ec.europa.eu/food/sites/food/files/safety/docs/f2f_action-plan_2020_strategy-info_en.pdf)) and includes a new comprehensive approach to increase European food sustainability.

In the framework of its F2F strategy, the EC has started a comprehensive evaluation of the animal welfare legislation and requested to EFSA a comprehensive and updated assessment of the scientific knowledge on welfare aspects of i) pigs, ii) calves, iii) laying hens, iv) broiler chickens and v) animal transportation.

Against this background, the EC requested EFSA to review the available scientific publications and possibly other sources to provide a sound scientific basis for future legislative proposals.

EFSA is requested to: i) describe, based on existing literature and reports, the current husbandry systems and practices of keeping the animals ii) describe the relevant welfare consequences iii) define qualitative or quantitative measures to assess the welfare consequences (animal-based measures) iv) identify the hazards leading to these welfare consequences v) provide recommendations to prevent, mitigate or correct the welfare consequences (resource and management-based measures).

In addition, the EC has identified practical difficulties or insufficient information in ensuring the welfare of the animals in certain specific scenarios. For these specific scenarios, EFSA should propose detailed qualitative (yes/no question) or quantitative (minimum/maximum) animal-based measures (ABMs) and preventive and corrective measures.

In the F2F mandates, a specific scenario relates to the need for EFSA to define ABMs collected and assessed in slaughterhouses to monitor the level of animal welfare on farms.

With specific reference to the protection of laying hens, EFSA is requested to collect evidence on the use of ABMs collected in slaughterhouses to monitor the level of welfare on laying hens' farms<sup>1</sup>.

EFSA is therefore developing the relevant sections of the scientific opinions on the protection of domestic fowl related to the production of eggs (laying hens), including a list of *ante-mortem* and *post-mortem* ABMs that could be used at slaughter to assess the welfare of laying hens on farm.

The scientific NCPs Network is composed by the EU MS (including EFTA Countries) National Contact Points that provide scientific support under Art 20 of Reg. (EC) 1099/2009 on the protection of the animals at the time of killing (scientific NCPs). At the annual Network meeting held in October 2021 an exercise was held to collect information from Network members on the use of ABMs at slaughter to assess farm welfare in laying hens.

## 2. Methodology

### 2.1. Questionnaire on the use of ABMs at slaughter to assess welfare of laying hens on farm

In preparation for the 2021 meeting scientific NCPs Network members were requested to complete an online questionnaire to collect information from their countries. The questionnaire was composed by two sections:

- Section on *ante-mortem* inspection of laying hens. It included an open field to be compiled with free text (see Annex A, Part A), giving the possibility for respondents to list relevant ABMs used in their countries (if any), together with their descriptions.
- Section on *post-mortem* inspection of laying hens, reporting an initial list of potentially relevant ABMs, together with their descriptions, produced by the EFSA experts on the basis of existing literature (Welfare Quality<sup>®</sup>, 2019) (see Annex A, Part B). *Post-mortem* ABMs are listed in Table 1.

<sup>1</sup> <https://open.efsa.europa.eu/questions/EFSA-Q-2020-00483>

**Table 1:** List of ABMs for *post-mortem* assessment produced by the EFSA's WG experts. Descriptions of ABMs are reported in Annex A, Part B.

| Laying hens |  |
|-------------|--|
| 1.          | Keel bone fracture                       |
| 2.          | Plumage damage                           |
| 3.          | Wounds                                   |
| 4.          | Bruise                                   |
| 5.          | Red or inflamed skin                     |
| 6.          | Keel bone prominence                     |
| 7.          | Indicators used for carcass condemnation |

A list of welfare consequences, and their descriptions, was also produced by the EFSA experts and proposed in the questionnaire to investigate the association between ABMs assessed at slaughter and the welfare consequences on farm. The list of welfare consequences is reported in Annex B.

The aim of the questionnaire was to collect data on end-of-lay hens.

In the section of the questionnaire on *post-mortem* inspection (Annex A, Part B), Network members were requested to:

- Indicate which of the listed ABMs are currently used in the slaughterhouses in the country as indicators of on-farm animal welfare;
- Indicate which scoring systems are in place to assess these ABMs;
- Provide an estimation of the ease of use of these ABMs (easy-medium-difficult);
- Identify the association between the ABMs assessed and welfare consequences on farm.

## 2.2. Exercise during the meeting

### 2.2.1. Open discussion

The questionnaire was discussed during the scientific NCPs Network meeting, held on 05-06 October 2021, where the exercise was continued to further discuss and to extend the information submitted by Network members. The main objectives were, for each ABM:

- to gather information on which ABMs are assessed in laying hens at slaughter.
- to gather information on whether Network members have any database (electronic recording) of the ABMs;
- to discuss the aim of monitoring the ABMs at the slaughterhouse (i.e. if an ABM was already recorded with the specific purpose of assessing animal welfare, and/or for other purposes);
- to know Network members' opinion on future development, i.e. if in their country the monitoring system is likely to be implemented in future
- to discuss possible scoring systems
- to define the ease of use of the ABM in a monitoring process implemented at the slaughterhouse.
- to collect information on the association between the ABM and the laying hen welfare consequences on farm.

### 2.2.2. Poll

In the context of a possible set up of a European standardised monitoring system in the future, participants were invited to score four specific questions on ABMs in *post-mortem*. Microsoft Forms (Microsoft ©) was the tool used to issue real-time polls and collect the answers. Each participant could submit the poll only once, and the submission was anonymous.

The questions of the poll were:

1. Do you think this ABM collected in *post-mortem* inspection at the slaughterhouse can provide information on the level of animal welfare on farm (worthiness of use)?
2. If we want to use this ABM for the purpose of assessing the welfare on farm, how do you consider it in the future? Do you think the assessment of this ABM is feasible with visual observation, feasible automatically by videos, both or impossible?
3. Do you think the level of feasibility for visual observation of the following ABMs at slaughter is feasible, moderate feasible or difficult?
4. If only a limited number of ABMs at slaughter are possible to be scored in practice, which are the most important ones to prioritise? Do you think this ABM is essential, desirable or not important?

Polling results were visualised, further analysed, and commented in the plenary discussion. After the poll, the results were shown to the participants and a discussion was carried out to comment or explain the results.

## 3. Results of the assessment

Seventeen questionnaires were submitted, and the data were discussed at the meeting to get a common understanding of the information provided. This gave the opportunity to two Network members to add information on the use of ABMs in their countries.

From the questionnaire and the discussion at the scientific NCPs Network meeting, it emerged that the assessment of ABMs at slaughter of laying hens is not uniform across Europe: in some countries ABMs are assessed both in *ante-* and *post-mortem* inspections (e.g. Germany and Sweden), in others either in *ante-* or in *post-mortem*, and in other countries no assessment of ABMs at slaughter is performed. In addition, some Network members reported that laying hens are not slaughtered in their countries but killed on-farm (e.g. Denmark and Iceland).

At the meeting, it was explained that, currently, ABMs at slaughter of laying hens are mainly used for food safety and food quality purposes. However, some welfare assessment systems are already in place without systematic data collections. Meeting participants also clarified that this assessment is usually performed at flock level and that the outcomes of this assessment are not routinely communicated to the farmers unless in the case of severe situations. In general terms, the best driver for improving the situation is acting on the stocking density on farm.

It was highlighted that animal welfare monitoring protocols are under development in some countries. Network members described a dynamic situation: national pilot projects are developing to classify the farms according to their level of animal welfare using the results from inspections at slaughter (e.g. Belgium and Germany).

The main outcomes of the entire exercise are reported in the following sections.

### 3.1. ABMs assessed *ante-mortem* at slaughter

From the questionnaire, seven countries out of the 19 respondents assess ABMs in *ante mortem* inspection of laying hens at slaughter. The ABMs used, together with some relevant information, were reported in the open field of the questionnaire (Annex A, Part A). The ABMs reported were mainly health-related, although some were also behaviour-related. These ABMs were: general health conditions, dead on arrival, on-farm mortality, clinical signs of abnormal sufferance or prostration, nervous clinical signs, abnormal dirtiness, plumage damage, signs of feather-pecking or cannibalism,

hypo- or hyperthermia, locomotory problems, fractures and injuries. However, each ABM was reported by only one or few countries.

From this initial list of ABMs, four were discussed in detail at the meeting and further information on their use was collected. These four ABMs were: abnormal dirtiness, plumage damage, injuries and dead on-arrival (DOA). As overall feedback from the discussion it was concluded that:

- **Abnormal dirtiness:** this ABM is assessed in few countries. It can be assessed by visual inspection at the reception control point when the birds are still in the crates. At the moment it is mainly assessed for food safety reasons, not on routinely basis, at batch level, and on a sample of birds. No specific scoring methods were reported by Network members. Communication to the farm starts in case birds result very dirty.
- **Plumage damage** is also used in few countries although it is considered indicator of on-farm welfare. The assessment of this ABM is considered more feasible in *ante-* than in *post-mortem* and it is usually performed when shackling the birds after removing them from the crates. Usually plumage damaged is assessed in some birds of all crates. No specific scoring methods were reported by Network members. Often there is no database to record the outcomes of the assessment, which is usually documented on papers. In case very poor conditions are observed, the outcome of the assessment is reported to the farmer to re-consider the stocking density on farm.
- **Injuries** in *ante-mortem* can be assessed on farm before the transport, when uncrating the birds at the slaughterhouse, or at shackling. Presence and type of injuries are recorded only if frequently observed in a flock. In this case they are also reported to the farmer. However, a threshold for further actions at farm level has not been set.
- **DOA** is assessed in several countries. At the meeting it was discussed the peculiarity of this indicator: although DOA is assessed in *ante-mortem* inspection, it intrinsically implies that birds are already dead. In general, dead-on-arrival is assessed at shackling, as a part of the meat assessment protocols. A follow-up to the farm and centralised systems for data collection are in place.

### 3.2. ABMs assessed *post-mortem* at slaughter

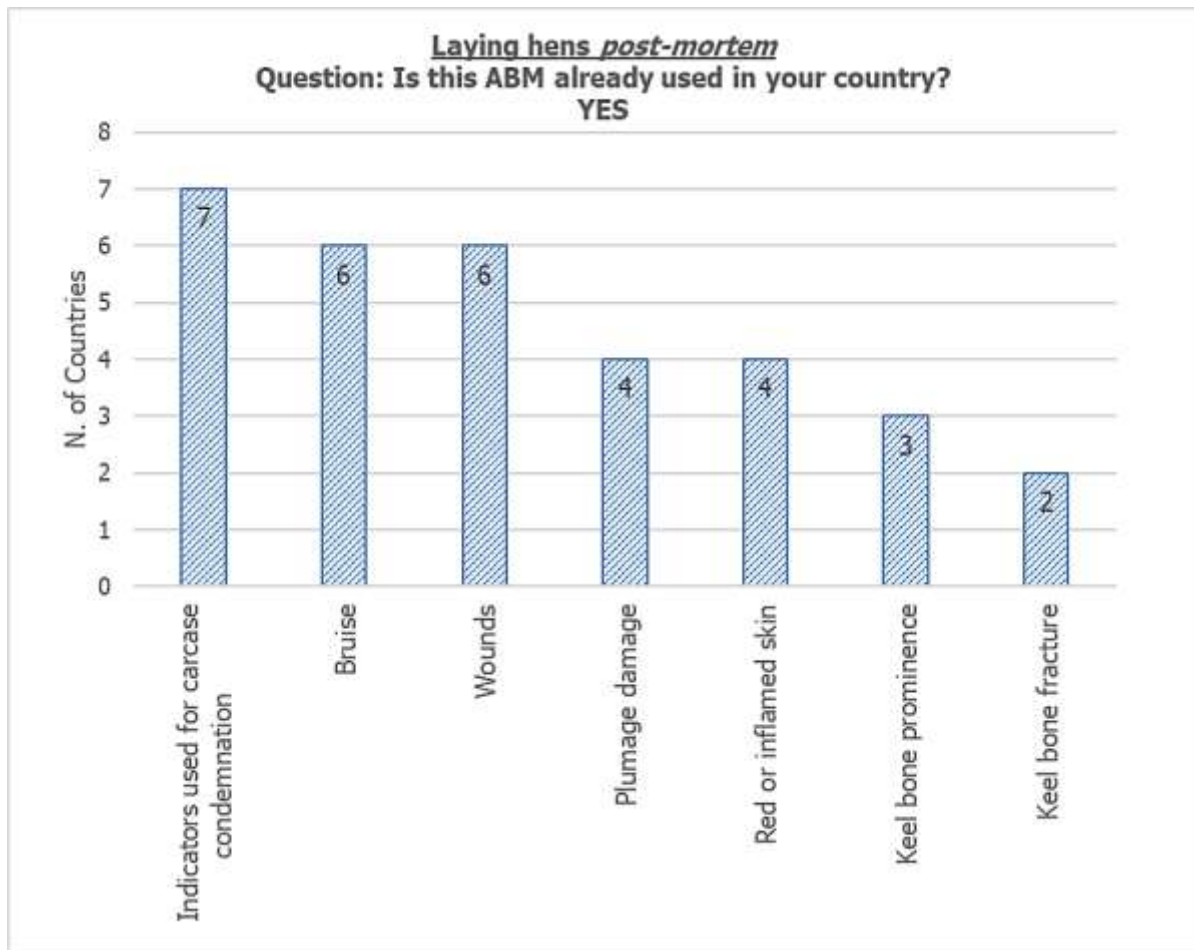
As previously explained, seven ABMs were originally proposed in the online questionnaire. The number of countries assessing these ABMs is reported in Figure 1.

As shown in Figure 1, all ABMs listed in the questionnaire were used during *post-mortem* inspection of laying hens. Keel bone prominence and keel bone fractures resulted as the less used ones.

In addition, few countries reported also the use of plumage cleanliness, detailing a use with the same features reported in the case of *ante-mortem* inspection (section 3.1).

During the Network meeting, it was discussed specific information could be gathered from the relevant assessment of certain ABMs, in particular:

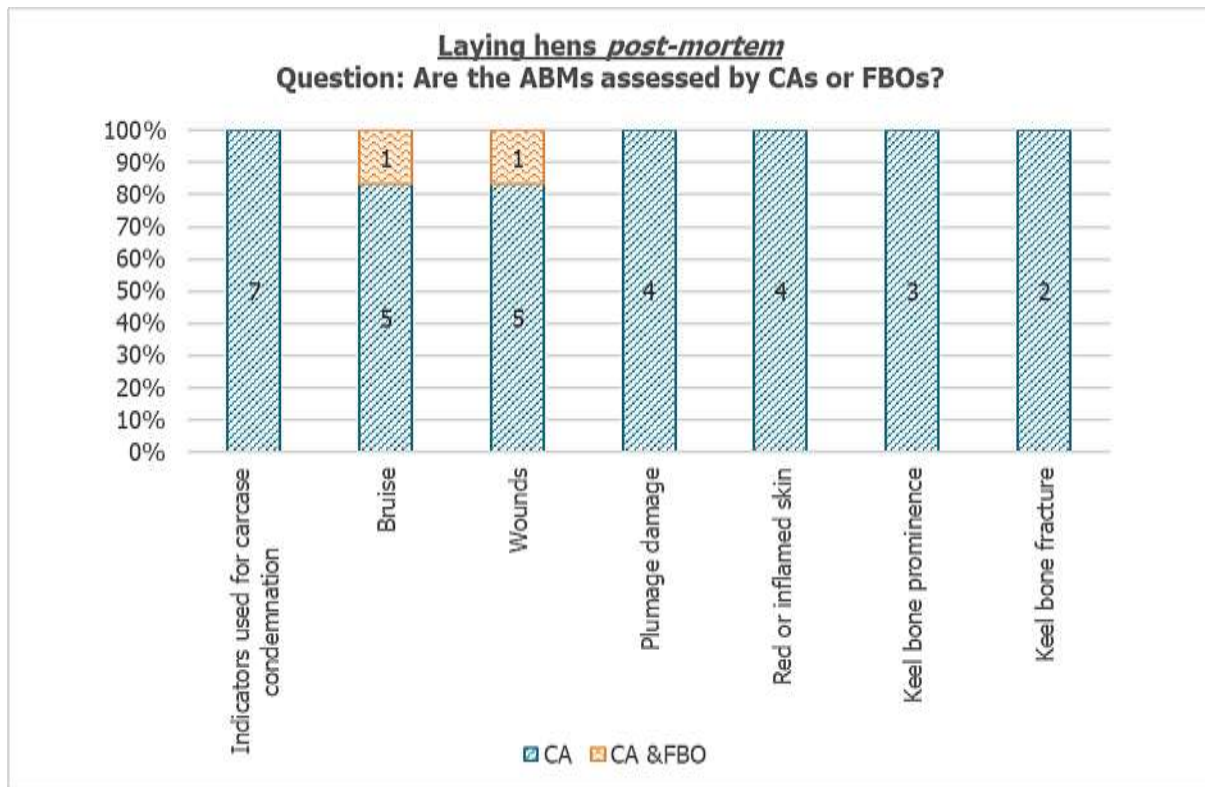
- **Red or inflamed skin** was reported as indicator particularly relevant for free range systems.
- **Wounds and bruises** can be also the result of transport conditions and are not only related to farming. The attempt to differentiate between the occurrence on farm and during transport is not well defined. However, it is generally considered that wind fractures are mainly related to transport conditions and uncrating birds from the cages at the abattoir; while wounds due to feather pecking or cannibalism are considered more related to the time that the animals are kept on farm.
- **Plumage damage** is considered related to the husbandry conditions, as enriched caged flocks are cleaner than free-range flocks.



**Figure 1:** ABMs assessed in *post-mortem* inspection in laying hens in the different countries. The y-axis indicates the number of responding countries (on a total of 19 respondents) reporting the use of each ABM. The ABMs proposed by the EFSA experts are visualized in the x-axis.

### 3.2.1. Assessment of ABMs at slaughter in *post-mortem* inspection by Competent Authorities or Food Business Operators

Network members were requested to indicate whether the assessment of the ABMs *post-mortem* is performed by the Competent Authority (CA) in the framework of the official controls, or by the Food Business Operator (FBO) in relation to e.g. internal quality controls or voluntary private schemes. The results of this question showed that ABM assessment were mainly conducted by CAs. However, in one country bruise and wounds were assessed by both CAs and FBOs (see Figure 2).



**Figure 2:** Proportion of countries where ABMs are used in *post-mortem* inspection of laying hens by Competent Authorities (CAs) or Food Business Operators (FBOs). The histograms report the number of respondents.

### 3.2.2. Association between ABMs assessed in *post-mortem* inspection and welfare consequences on farm

The possible association between ABMs and on farm welfare consequences was investigated by analysing the replies to a specific section of the questionnaire (see section 3.2.2.1) and through an on-site poll (see section 3.2.2.2) at the meeting.

#### 3.2.2.1. Identification of welfare consequence associated with ABMs assessed *post-mortem*

The results showed that the respondents associated all ABMs monitored at slaughter with more than one on-farm welfare consequence (see Table 2). In particular, the assessment of indicators used for carcasses condemnation at slaughter was potentially associated with 20 different on-farm welfare consequences, similarly keel bone prominence (18 welfare consequences), whereas red or inflamed skin, wounds and plumage damage were associated with 14 welfare consequences, bruise with 13, and keel bone fracture with eight.

**Table 2:** Most of the on-farm welfare consequences listed in the questionnaire were associated with at least one *post-mortem* ABM at slaughter, apart from: eye disorder, inability to chew or ruminant, inability to perform play behaviour, inability to perform sexual behaviour and separation stress. Some of these welfare consequences are in fact relevant for mammalians and not for birds (e.g. inability to chew or ruminant). ABMs and related welfare consequences in *post-mortem* assessment in laying hens.

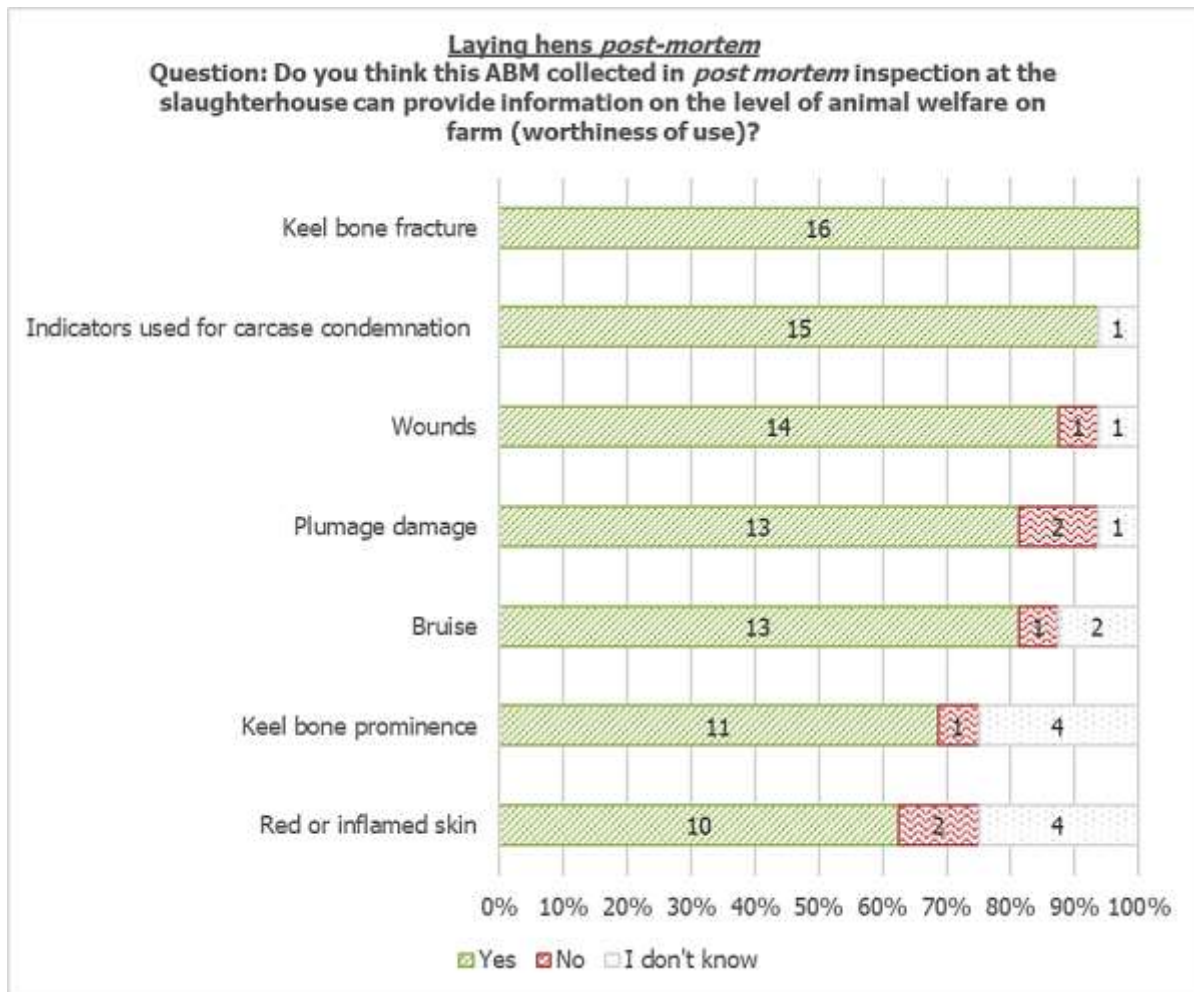
| ABM observed at slaughter                | On-farm related welfare consequences |
|--|--------------------------------------|
| Indicators used for carcass condemnation | Group stress<br>Metabolic disorders  |

| ABM observed at slaughter | On-farm related welfare consequences  |
|---------------------------|---|
|                           | Resting problems<br>Restriction of movement<br>Handling stress<br>Inability to perform comfort behaviour<br>Locomotory disorders (including lameness)<br>Predation stress<br>Sensorial under and/or overstimulation<br>Skin disorders (other than soft tissue lesions and integument damage)<br>Bone lesions (incl. fractures and dislocations)<br>Muscle disorders<br>Soft tissue lesions and integument damage<br>Gastro-enteric disorders<br>Heat stress<br>Prolonged hunger<br>Prolonged thirst<br>Reproductive disorders<br>Respiratory disorders<br>Umbilical disorders and hernias |
| Keel bone prominence      | Group stress<br>Metabolic disorders<br>Resting problems<br>Restriction of movement<br>Inability to perform comfort behaviour<br>Locomotory disorders (including lameness)<br>Predation stress<br>Sensorial under and/or overstimulation<br>Skin disorders (other than soft tissue lesions and integument damage)<br>Bone lesions (incl. fractures and dislocations)<br>Muscle disorders<br>Gastro-enteric disorders<br>Heat stress<br>Cold stress<br>Prolonged hunger<br>Prolonged thirst<br>Reproductive disorders<br>Respiratory disorders  |
| Red or inflamed skin      | Group stress<br>Metabolic disorders<br>Resting problems<br>Restriction of movement<br>Handling stress<br>Inability to perform comfort behaviour<br>Locomotory disorders (including lameness)<br>Predation stress<br>Sensorial under and/or overstimulation<br>Skin disorders (other than soft tissue lesions and integument damage)<br>Muscle disorders<br>Soft tissue lesions and integument damage<br>Gastro-enteric disorders<br>Inability to perform exploratory or foraging behaviour  |
| Wounds                    | Group stress<br>Metabolic disorders<br>Resting problems<br>Restriction of movement<br>Handling stress<br>Inability to perform comfort behaviour<br>Locomotory disorders (including lameness)<br>Predation stress<br>Sensorial under and/or overstimulation  |

| ABM observed at slaughter | On-farm related welfare consequences  |
|---------------------------|---|
|                           | Skin disorders (other than soft tissue lesions and integument damage)<br>Muscle disorders<br>Soft tissue lesions and integument damage<br>Cold stress<br>Inability to avoid unwanted sexual behaviour   |
| Plumage damage            | Group stress<br>Metabolic disorders<br>Resting problems<br>Restriction of movement<br>Handling stress<br>Inability to perform comfort behaviour<br>Predation stress<br>Sensorial under and/or overstimulation<br>Skin disorders (other than soft tissue lesions and integument damage)<br>Soft tissue lesions and integument damage<br>Gastro-enteric disorders<br>Heat stress<br>Inability to express maternal behaviour<br>Isolation stress           |
| Bruise                    | Group stress<br>Metabolic disorders<br>Resting problems<br>Restriction of movement<br>Handling stress<br>Inability to perform comfort behaviour<br>Locomotory disorders (including lameness)<br>Predation stress<br>Sensorial under and/or overstimulation<br>Skin disorders (other than soft tissue lesions and integument damage)<br>Bone lesions (incl. fractures and dislocations)<br>Muscle disorders<br>Soft tissue lesions and integument damage |
| Keel bone fracture        | Group stress<br>Metabolic disorders<br>Resting problems<br>Restriction of movement<br>Handling stress<br>Locomotory disorders (including lameness)<br>Bone lesions (incl. fractures and dislocations)<br>Muscle disorders   |

**3.2.2.2. ABMs collected in *post-mortem* inspection at the slaughterhouse to provide information on the level of animal welfare on farm**

At the meeting, participants were asked to express their opinion, through the poll, on the worthiness of each ABM to be employed for an evaluation of on-farm welfare conditions. From the results of the poll, all the ABMs were considered informative on the level of animal welfare on farm (see Figure 3).

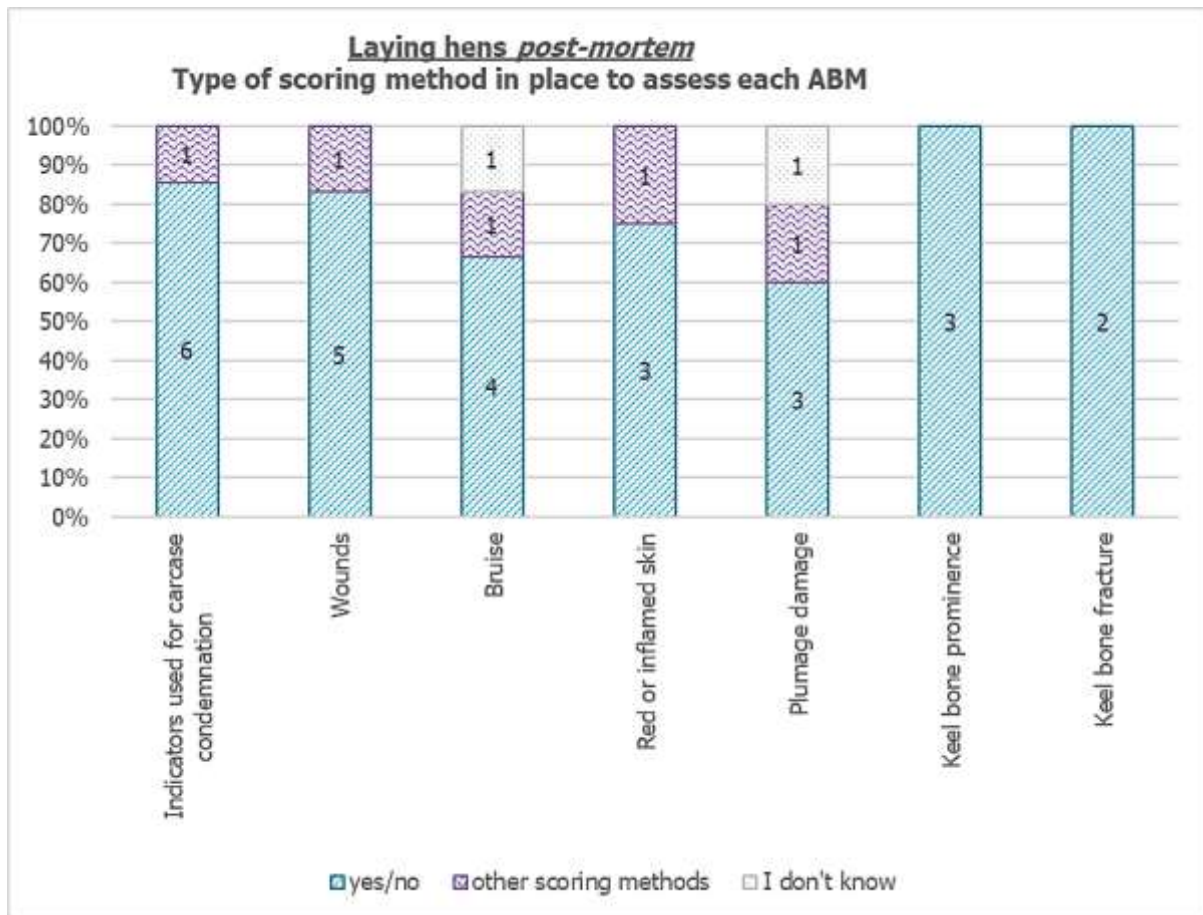


**Figure 3:** Results from the poll on the worthiness of each *post-mortem* ABM to be used for an evaluation of on-farm welfare conditions. The histograms report the number of respondents, out of the 16 Network members that responded to this question.

### 3.2.3. Scoring methods in *post-mortem* assessment

Details on the scoring method used to assess the ABMs used in *post-mortem* inspection were requested in the questionnaire.

Results showed that for all ABMs most of the respondents used a simple assessment method based on presence/absence of the ABM (referred as 'yes/no scoring'), and that only one country indicated 'other scoring method' as the one currently in place (see Figure 4). In general, the result of the assessment is recorded only if the carcass needs to be discarded, by reporting the percentage of affected birds on the total flock. Severe cases are communicated to the farmer upon decision of the official veterinarian at the slaughterhouse.

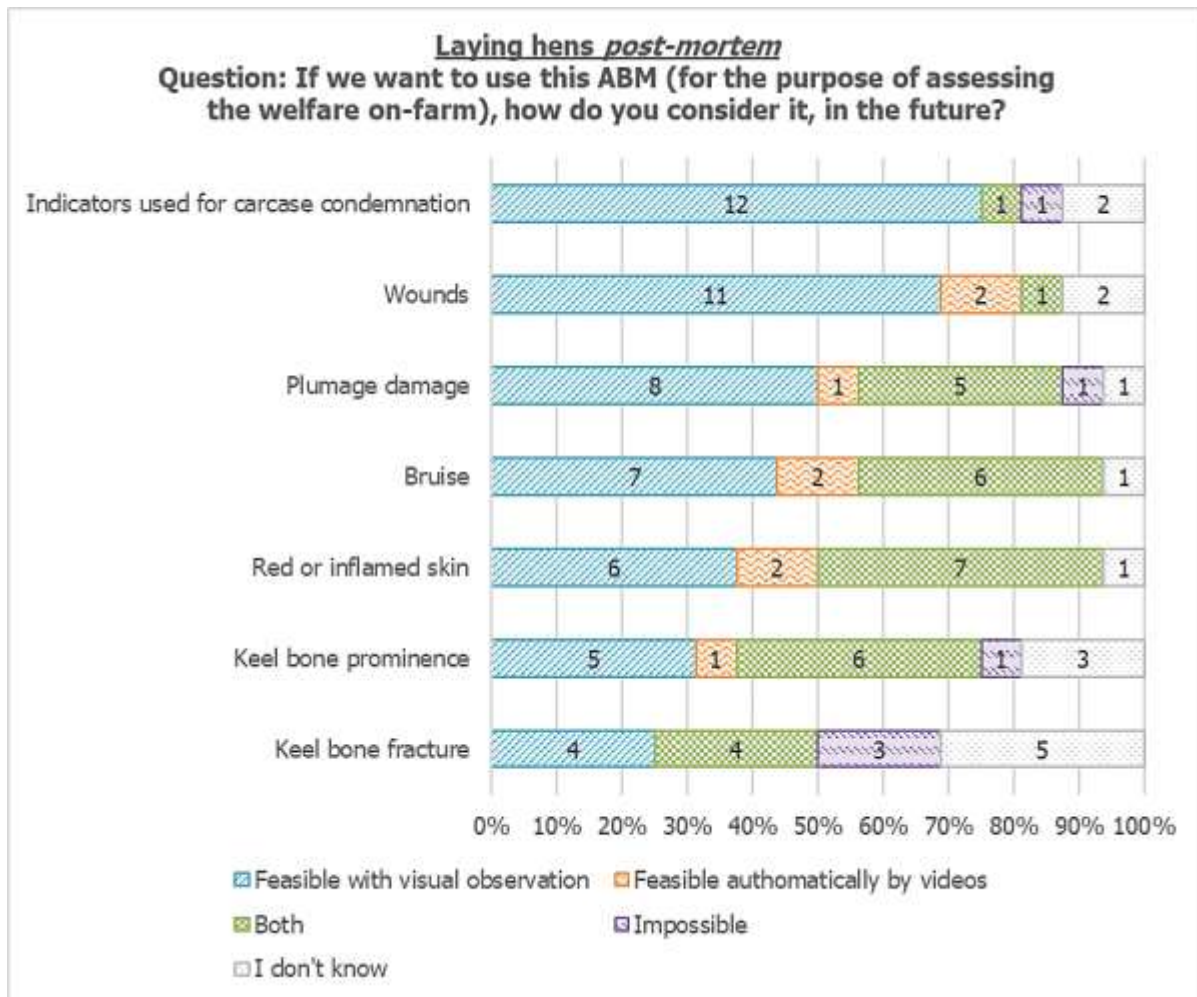


**Figure 4:** ABMs and scoring methods: results from the questionnaire on the type of scoring method used for assessing each ABM. The histograms report the number of respondents.

### 3.2.4. Ease of use and feasibility of ABMs assessed *post-mortem*

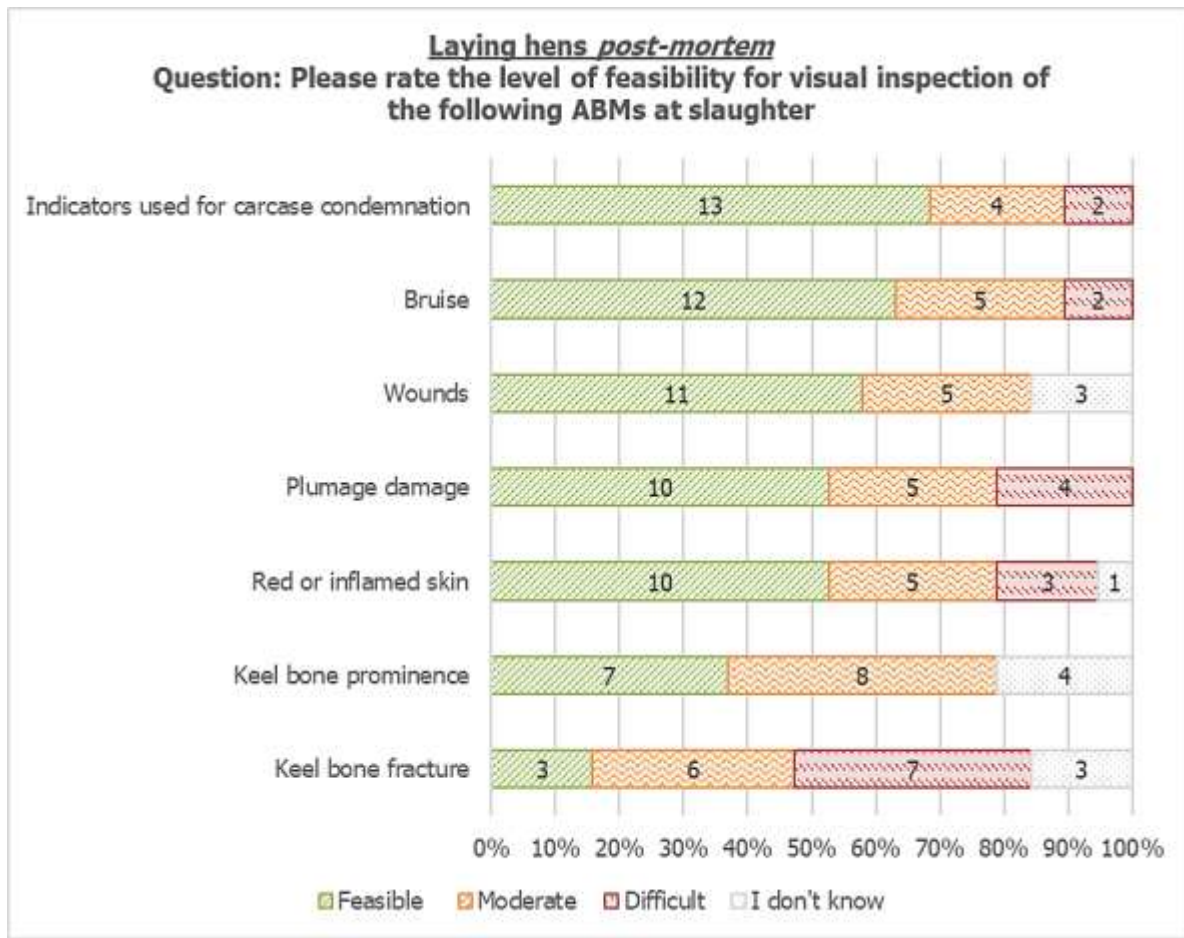
As a feedback from the online questionnaire, information on the ease of use of each ABM was also gathered. The assessment of all ABMs was in general reported of medium difficulty although quite some heterogeneity was reported among countries.

During the discussion at the meeting a question was polled to get Network members' opinion on the type of assessment and the level of automatization that will be developed in the future for the purpose of assessing the welfare on the farm. Network members were asked to indicate in the poll if the assessment of each ABM could be feasible only by visual observation, automatically by using videos, feasible in both cases or generally impossible (Figure 5). The results demonstrated a variety of votes for all ABMs, with the exception of wounds and indicators used for carcase condemnation, that most of the participants voted as feasible with visual observation. Network members discussed in detail the other results of the poll: both keel bone fracture and prominence were considered feasible to be assessed by visual observation, but it emerged that it is difficult to entirely assess fractures without palpation. Moreover, palpation can easily assess severe recent fractures, while highly trained inspectors are needed to recognise old or less severe fractures. Keel bone prominence is indeed more feasible to be assessed by visual assessment, indicating emaciated animals. Wounds and bruises can be assessed with both systems. It was reported that the colour assessment can distinguish between old or recent injuries and that the best moment for assessing it is at scalding. Finally, the assessment of plumage damage was considered by most of respondents feasible both visually and automatically.



**Figure 5:** Results of the poll on the feasibility of ABMs. The histograms report the number of respondents.

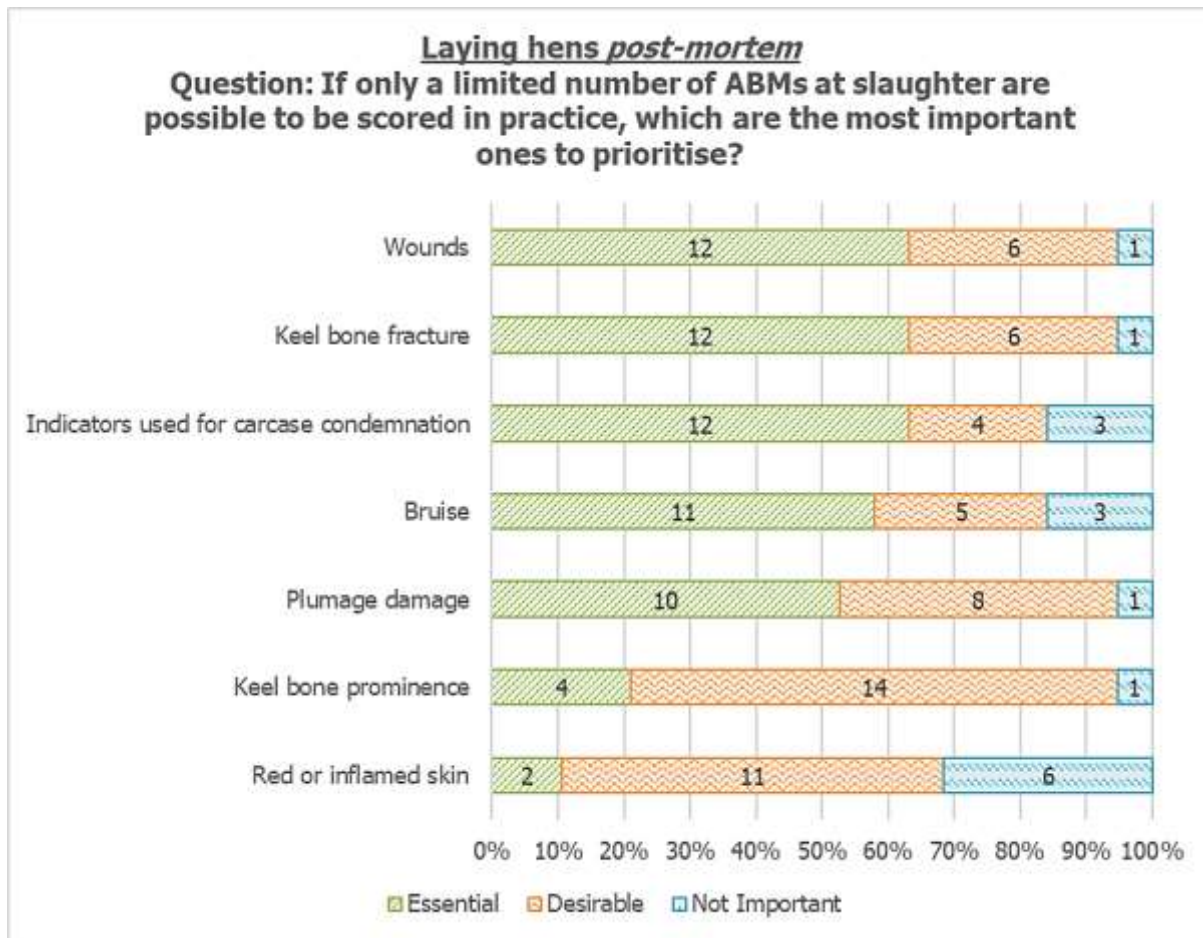
Subsequently, meeting participants were also asked to express their opinion on the level of feasibility for visual inspection of each ABM by classifying them in three categories: feasible, moderate feasible or difficult. As visualised in Figure 6, more than 50% of the respondents considered visual inspection feasible for all the ABMs with the exception of keel bone fractures that was considered difficult, and keel bone prominence for which visual inspection was considered of moderate feasibility (see Figure 6). Indicators used for carcass condemnation was the most feasible ABM to be assessed visually. Although red skin was considered 'feasible' by most of the respondents, it was discussed that this ABM can be the consequence of inefficient bleeding at slaughter, and therefore difficult to be accurately related to on-farm welfare. To avoid that, assessors should be trained to distinguish between congested and inflamed skin. Wounds and bruises are considered easy to be assessed visually, although it might be difficult to make a distinction between bruises related to catching/crating of the birds on-farm, transport conditions and uncrating at the slaughterhouse, and those resulting from the conditions on farm.



**Figure 6:** Results of the poll on the level of feasibility for visual inspection of ABMs. The histograms report the number of respondents.

### 3.2.5. Prioritization of ABMs *post-mortem*

Network members were asked to prioritize the ABMs, i.e. to classify them as essential, only desirable or not important for any future welfare monitoring scheme (Figure 7). In response to the poll, most of the respondents considered wounds, keel bone fractures and indicators used for carcass condemnation as essential ABMs to be prioritised for assessing the welfare of laying hens on-farm. Keel bone prominence and red or inflamed skin were considered only desirable by most of participants.



**Figure 7:** Results of exercise on prioritization of the ABMs. The histograms report the number of respondents.

#### 4. Conclusions

To address the F2F mandates, EFSA is assessing a list of *ante-mortem* and *post-mortem* ABMs for use at slaughter to monitor animal welfare on farm. The members of the Network of the EU MS (including EFTA Countries) National Contact Points for scientific support under Art 20 of Reg. (EC) 1099/2009 on the protection of the animals at the time of killing (scientific NCPs) shared their practical knowledge on the use of these ABMs in an exercise performed during the Network meeting held on October 2021.

Network members consider that the ABMs proposed by EFSA are (almost without exception) strongly related to welfare consequences on farm. This supports their inclusion in the EFSA scientific opinion on the "Protection of laying hens" that will be delivered by the working group in 2022. Among an initial list of ABMs discussed at the meeting, those that are considered essential for a welfare assessment at slaughter were prioritised (see section 3.1 for *ante-mortem* and Figure 7 for *post-mortem*). However, the methods applied for scoring ABMs are considerably different between European countries. The information obtained in this report will be considered in the scientific opinion.

## 5. References

Welfare Quality®, 2019. Welfare Quality® assessment protocol for laying hens, version 2.0. Welfare Quality® Consortium, Lelystad, The Netherlands. Available online: [http://www.welfarequalitynetwork.net/media/1294/wq\\_laying\\_hen\\_protocol\\_20\\_def-december-2019.pdf](http://www.welfarequalitynetwork.net/media/1294/wq_laying_hen_protocol_20_def-december-2019.pdf)

## Annex A – Questionnaire *ante-* and *post- mortem* inspections of laying hens (end-of-lay hens)

| Please indicate the country you represent  |   |   |   |   |   |   |   |
|--|---|---|---|---|---|---|---|
| Name and affiliation:  |   |   |   |   |   |   |   |
| <b>Part A: <i>Ante-mortem</i> inspection</b><br>please indicate if you collect ABMs at slaughter in ante-mortem to assess the welfare on farm, and provide relevant info (which ABMs, which scoring systems etc...): e.g. huddling animals, DoA,.... |   |   |   |   |   |   |   |
| Please enter free text   |   |   |   |   |   |   |   |
| <b>Part B: <i>Post-mortem</i> inspection</b>   |   |   |   |   |   |   |   |
| ABM  | DESCRIPTION                                       | IS THIS ABM ALREADY USED IN YOUR COUNTRY?   | IF SO, WHICH SCORING SYSTEM DO YOU USE?<br>Please specify which scoring system is in place in your country and how is it scored; specify if this scoring is used under official or voluntary controls |   |   | EASE OF USE   | CORRESPONDING WELFARE CONSEQUENCE ON FARM (see Annex B)   |
|  |   | Please answer (Yes/No) and specify if it relates to official controls (CA) or private voluntary schemes (FBO) | Scoring method 1 -<br>Total count of the affected animals   | Scoring method 2 -<br>other scoring method (please detail it)<br><br>More sophisticated way for scoring the ABMs - e.g. scoring scales based on the severity (please detail it) | Scoring method 3 -<br>other scoring method (please detail it) | Please estimate if the use of this ABM is:<br><br>easy-<br>medium-<br>difficult | In your view, what welfare problem on farm does this ABM indicate?<br>e.g.; plumage damage due to group stress, inability to perform exploratory and foraging behaviour,... |
| <b>ABM 1 - Keel bone fracture</b>  | Complete or partial break in the keel bone, which |   |   |   |   |   |   |

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|                                    | may, or may not, have healed resulting in a callus   |  |  |  |  |  |  |
| <b>ABM 2- Plumage damage</b>       | Plumage damage includes damaged feathers or feather loss   |  |  |  |  |  |  |
| <b>ABM 3- Wounds</b>               | Tissue damage with rupture of the skin or not (scratches. Injury, open abscess,...). Wounds that are not yet completely healed.  |  |  |  |  |  |  |
| <b>ABM 4- Bruise</b>               | Bruising is a superficial injury that occurs after trauma, it results from an hematoma and is often without rupture of the skin  |  |  |  |  |  |  |
| <b>ABM 5- Red or inflamed skin</b> | Sign of skin inflammation due to primary bacterial infections and/or parasitic agent infestation e.g. red mite infestation. Skin can be red, hot and/or swollen  |  |  |  |  |  |  |
| <b>ABM 6- Keel bone prominence</b> | Emaciated birds, which can be assessed by estimating keel bone prominence. Laying hens are a lean type of bird, meaning that some keel bone prominence is normal. A bird with normal body condition will have some breast muscles present. Emaciated birds hardly have any breast muscle tissue left and |  |  |  |  |  |  |

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|   | have a very edged and prominent keel bone.   |  |  |  |  |  |  |
| <b>ABM 7- Indicators used for carcass condemnation (e.g., septicaemia, hepatitis, pericarditis, abscess, arthritis)</b> | Carcasses (i.e. number of animals or weight of the carcasses condemned) that are unfit for use as food |  |  |  |  |  |  |
| <b>OTHER ABMs</b>   |  |  |  |  |  |  |  |
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## Annex B – Overall list of welfare consequences (preliminary list drafted by EFSA)

| Welfare consequence   | Description  |
|---|--|
| <b>Restriction of movement</b>                                | The animal experiences stress and/or negative affective states such as pain, fear, discomfort and/or frustration due to the fact that it is unable to move freely, or is unable to walk comfortably (e.g. due to overcrowding, unsuitable floors, gates, barriers).              |
| <b>Resting problems</b>                                       | The animal experiences stress and/or negative affective states such as discomfort, and/or frustration due to the inability to lie/rest comfortably or sleep. (e.g. due to hard flooring, inability to perch or vibration during transport). This may eventually lead to fatigue. |
| <b>Group stress</b>   | The animal experiences stress and/or negative affective states such as pain, fear and/or frustration resulting from a high incidence of aggressive and other types of negative social interactions, often due to hierarchy formation and competition for resources or mates.     |
| <b>Sensorial under and/or overstimulation</b>                 | The animal experiences stress and/or negative affective states such as fear, discomfort due to visual, auditory or olfactory under/overstimulation by the physical environment.  |
| <b>Handling stress</b>  | The animal experiences stress and/or negative affective states such as pain and/or fear resulting from human or mechanical handling (e.g. sorting and vaccination of newly hatched chicks, loading/unloading, catching and crating of animals to be transported, inversion).     |
| <b>Isolation stress</b>                                       | The animal experiences stress and/or negative affective states such as frustration and/or fear resulting from the absence of or from limited social contact with conspecifics.   |
| <b>Separation stress</b>                                      | The animal experiences stress and/or negative affective states such as fear and/or frustration resulting from separation from conspecifics.  |
| <b>Inability to perform comfort behaviour</b>                 | The animal experiences stress and/or negative affective states such as discomfort and/or frustration resulting from the thwarting of the motivation to maintain the function and integrity of the integument (e.g. cannot keep clean, scratch, dust bathe).                      |
| <b>Inability to perform sexual behaviour</b>                  | The animal experiences stress and/or negative affective states such as frustration resulting from the thwarting of the motivation to engage in sexual activities.  |
| <b>Inability to avoid unwanted sexual behaviour</b>           | The animal experiences stress and/or negative affective states such as pain and/or fear resulting from inability to avoid forced mating.   |
| <b>Inability to perform exploratory or foraging behaviour</b> | The animal experiences stress and/or negative affective states such as frustration and/or boredom resulting from the thwarting of the motivation to investigate the environment or to seek for food (i.e. extrinsically and intrinsically motivated exploration).                |
| <b>Inability to express maternal behaviour</b>                | The animal experiences stress and/or negative affective states such as frustration resulting from the thwarting of the motivation to care for offspring, including during the pre-partum/pre-laying phase.   |
| <b>Inability to perform sucking behaviour</b>                 | The animal experiences stress and/or negative affective states such as frustration resulting from the thwarting of the motivation to suck from an udder.   |
| <b>Inability to chew and/or ruminate</b>                      | The animal experiences stress and/or negative affective states such as frustration resulting from the thwarting of the motivation to ingest sufficient amounts of fibrous feed or the inhibition of rumination.  |
| <b>Inability to perform play behaviour</b>                    | The animal experiences stress and/or negative affective states such as frustration resulting from the thwarting of the motivation to engage in social/locomotory or object play.   |
| <b>Predation stress</b>                                       | The animal experiences stress and/or negative affective states such as fear and/or pain resulting from being attacked or perceiving a high predation risk  |
| <b>Prolonged hunger</b>                                       | The animal experiences craving or urgent need for food or a specific nutrient, accompanied by a negative affective state, and eventually leading to a weakened condition as metabolic requirements are not met   |

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| <b>Prolonged thirst</b>  | The animal experiences craving or urgent need for water, accompanied by an uneasy sensation (a negative affective state), and eventually leading to dehydration as metabolic requirements are not met.   |
| <b>Heat stress</b>   | The animal experiences stress and/or negative affective states such as discomfort and/or distress due to the difficulty to maintain body temperature in the thermoneutral zone when exposed to high effective temperature.   |
| <b>Cold stress</b>   | The animal experiences stress and/or negative affective states such as discomfort and/or distress due to the difficulty to maintain body temperature in the thermoneutral zone when exposed to low effective temperature.  |
| <b>Locomotory disorders (including lameness)</b>                             | The animal experiences negative affective states such as pain, discomfort and/or due to impaired locomotion induced by e.g. bone, joint, skin or muscle damage.  |
| <b>Soft tissue lesions and integument damage</b>                             | The animal experiences negative affective states such as pain, discomfort and/or distress due to physical damage to the integument or underlying tissues, e.g. multiple scratches, open or scabbed wounds, bruises, ulcers, abscesses and feather or hair loss. This welfare consequence may result from negative social interactions such as aggression, tail-biting or feather pecking, from handling or from damaging environmental features, or from mutilation practices (e.g. beak trimming, de-toeing, de-horning, tail docking). |
| <b>Bone lesions (incl. fractures and dislocations)</b>                       | The animal experiences negative affective states such as pain, discomfort and/or distress due to fractures or dislocations of the bones (excluding those fractures leading to locomotory disorders).   |
| <b>Skin disorders (other than soft tissue lesions and integument damage)</b> | The animal experiences negative affective states such as pain, discomfort and/or distress due to e.g. infections (e.g. dermatophytosis/ringworm, pseudomonosis, staphylococcosis, viral diseases), ectoparasites (e.g. mange or red mites), inflammation of the skin or sunburn.   |
| <b>Respiratory disorders</b>   | The animal experiences negative affective states such as discomfort, pain, air hunger and/or distress due to impaired function or lesion of the lungs or airways.  |
| <b>Eye disorders</b>   | The animal experiences negative affective states such as discomfort, pain and/or distress due irritation or lesion or lack of function of at least one eye.  |
| <b>Gastro-enteric disorders</b>  | The animal experiences negative affective states such as inappetence, discomfort, pain and/or distress due to impaired function or lesion of the gastro-intestinal tract resulting from for example nutritional deficiency, infectious, parasitic, or toxigenic agents.  |
| <b>Reproductive disorders</b>  | The animal experiences negative affective states such as pain and/or discomfort due to a disorder of the reproductive system resulting from physical injury or infection (including dystocia and metritis).  |
| <b>Mastitis</b>  | The animal experiences negative affective states such as pain and/or discomfort due to the inflammation of at least one of the mammary glands.   |
| <b>Metabolic disorders</b>   | The animal experiences negative affective states such as inappetence, weakness, fatigue, discomfort, pain and/or distress due to disturbed metabolism (e.g. acidosis and ketosis), deficiencies in several nutrients (e.g. anaemia) or induced by ectoparasites affecting metabolism (anaemia due to red mites) or poisoning   |
| <b>Muscle disorders</b>  | The animal experiences negative affective states such as discomfort and/or pain due to a disorder or lack of function of the muscles (e.g. myopathy in broilers).  |
| <b>Umbilical disorders and hernias</b>                                       | The animal experiences negative affective states such as discomfort and/or pain due to inflammation of the navel or any type of hernias  |