

# Laying hens' welfare: Policy recommendations

Annex to White Paper - No Animal Left Behind:  
The need for a new Kept Animals Regulation  
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# Laying hens' welfare: Policy recommendations

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# Laying hens' welfare: Policy recommendations

## Executive summary

Eurogroup for Animals supports the work of the European Commission around new animal welfare legislation and offers expertise gathered through years of working towards a better world for animals. The recommendations provided are based on the "Five Domains" framework, initially proposed by Professor David Mellor and Dr Cam Reid in 1994<sup>1</sup>. They reformulated the "Five Freedoms" into a new model to systematically identify and grade different aspects of welfare, based on the animals' nutrition, environment, health, behaviour and mental state domains.

For each domain, this paper provides an overview of the current legislation applying to laying hens, highlights the shortcomings, and suggests amendments to improve animal welfare during the whole production cycle. The policy recommendations and scientific sources are provided.

Eurogroup for Animals believes that a promising future legal landscape for animals can be built only through structured, strong laws based on the best available science. This document has been produced to support the work around drafting such legislation.

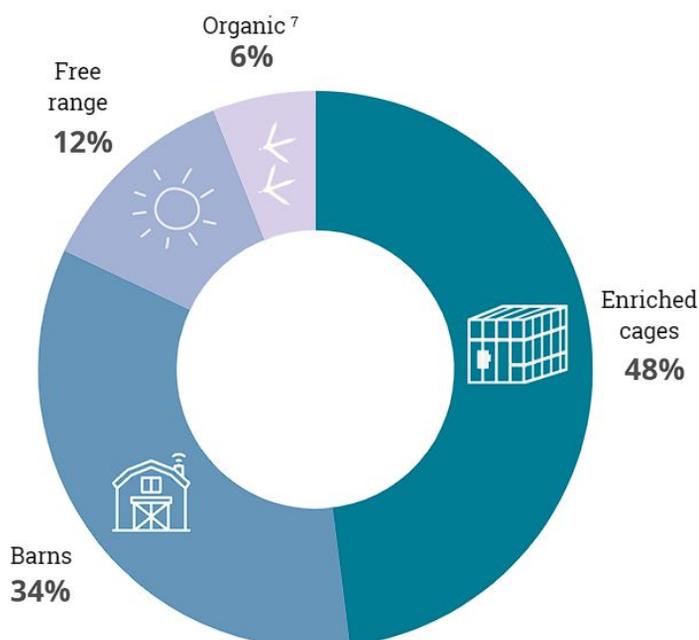
## Introduction

As requested by European citizens<sup>2</sup> and backed by science, the European Union's (EU's) animal welfare legislation must be adjusted to the needs of the animals. The focus must be on species-specific provisions allowing for animals to experience a good life. Eurogroup for Animals works to ensure that animals can have a life that is interesting and full of new experiences, in which they are not confined within a cage, and they are free from pain due to painful husbandry procedures, selection for high productivity, chronic conditions, mutilations or other impairments resulting from the desire to maximise economic gain.

<sup>1</sup> Mellor, D.J., Reid, C.S.W. (1994) Concepts of animal well-being and predicting the impact of procedures on experimental animals. WellBeing International. 1994.

<sup>2</sup> European Union (2015). Attitudes of Europeans towards Animal Welfare. Special Eurobarometer 442 - November - December 2015. European Union, 2015.

**With this document, we present to the European decision makers a set of policy recommendations for the revision of the legislation applicable to laying hens.** The recommendations are either additions or corrections to the existing legislation, as in some cases there is currently no mention of much-needed provisions, and in others, the existing wording on certain issues needs updating according to the available body of science and experience. These recommendations are structured within the framework of the Five Domains model, conceived in 1994, further elaborated in 2016<sup>3</sup> and 2020<sup>4</sup>. Our proposed provisions, if well-implemented, will ensure that laying hens will enjoy a good life. The suggested amendments cover all steps of the production cycle - from hatching to slaughter - including also the welfare of pullets and parent stock. Latest data suggests that there are over 370 million laying hens in the Union<sup>5</sup>, producing over 7.1 million tonnes of eggs yearly<sup>6</sup>. In 2020, they were kept as follows:



This means that in 2020, 328 million birds never got to go outside, and 192 million were still confined to cages for their entire lives.

<sup>3</sup>Mellor, D. (2016). Updating animal welfare thinking: Moving beyond the “five freedoms” towards “A life worth living”. *Animals*. 2016, March;6(3): 1 - 20.

<sup>4</sup>Mellor, D. J., Beausoleil, N. J., Littlewood, K. E., McLean, A. N., McGreevy, P. D., Jones, B., & Wilkins, C. (2020). The 2020 Five Domains Model: Including Human–Animal Interactions in Assessments of Animal Welfare. *Animals*, 10(10), 1870.

<sup>5</sup>Eggs\_Market situation\_Dashboard (2020). Accessed on: 2nd March 2022. Available at [https://ec.europa.eu/info/food-farming-fisheries/animals-and-animal-products/animal-products/eggs\\_en](https://ec.europa.eu/info/food-farming-fisheries/animals-and-animal-products/animal-products/eggs_en).

<sup>6</sup>European Commission (2019). EU agricultural outlook for markets and income, 2019-2030. European Commission, DG Agriculture and Rural Development. European Union. 2019, December.

<sup>7</sup>Eggs\_Market situation\_Dashboard (2020). See footnote 5.

Change has never been more attainable than now. The European Commission has an opportunity to deliver, in line with its ambitions contained in the Farm to Fork strategy, a future-proof legal foundation for evidence-based standards that provide the ability for all farmed animals to experience a positively affected mental state.

Any farming practices that cannot meet such requirements should, in effect, be eliminated.

In doing so, the EU would remain a world leader in animal welfare standards, citizens expectations would be met, and no animal would be left behind.

How to use this document:

- Policy recommendations are provided according to each of the Five Domains;
- A brief explanation with scientific references is given for each recommendation;
- Appendix 1 provides the detail of the existing articles on the EU animal welfare legislation that apply to each of the Five Domains.

## Eurogroup for Animals' recommendations

Eurogroup for Animals calls for the revision of the European animal welfare law and the introduction of the following standards to provide laying hens with the conditions to experience a "good life". The standards recommended have been organised into Mellor's Five Domains and apply to hatcheries, pullets, laying hens, and breeding animals regardless of the size of the holding in which they are farmed, overcoming the limitations of the Council Directive 1999/74/EC (Laying Hens Directive) whose provisions currently do not apply to hens kept in establishments with fewer than 350 laying hens, nor to hatcheries, pullets, or breeders (Laying Hens Directive, Article 1). For these animals, only the Council Directive 98/58/EC<sup>8</sup> (General Farm Directive) applies.

Additionally, to ensure effective implementation, we call for a strict European control mechanism and transparent reporting policy.



<sup>8</sup> Council Directive 98/58/EC of 20 July 1998 concerning the protection of animals kept for farming purposes. *Official Journal L 221*, 08/08/1998 P. 0023 - 0027.



## Domain 1: Nutrition/Hydration

### Policy recommendations

1. All laying hens must have access to feed at intervals appropriate to their physiological needs, parent stock included;
2. Feed restriction practices must be explicitly forbidden;
3. Adequate feeding and hydration of chicks and breeders must be provided;
4. Chicks should be provided with feed and water immediately after hatch.

### Explanation

The amount, composition, and distribution of feed must promote good welfare, including maintaining physiological condition and health, having energy for necessary and normal behaviours, feeling satisfied, maintaining homeostasis, and maintaining growth.

Welfare impacts of feed and water comprise the following main elements: suitability, quantity, and accessibility. Of the three, accessibility can be influenced by the design of the housing system, whereas suitability and quantity are factors determined by management. Laying hens should have ad libitum access to adequate feed and water. Feed composition can affect health parameters, particularly the occurrence of injurious feather pecking. Inadequate fibre or amino acid content in the diet can lead to severe feather pecking, so fibre supplementation may be required<sup>17</sup>. Scattering grains and fibrous feed on the ground gives hens the opportunity to complement their diets while also spending time foraging.

Parent stock is explicitly excluded from the Laying Hens Directive, and so any reference to feed does not apply to breeding animals. The General Farming Directive does, however, state that "All animals must have access to feed at intervals appropriate to their physiological needs." This should mean that feed restriction practices are not permitted, however, they need to be explicitly banned.

As chicks are currently excluded from the Directive, they must be protected in the revised piece of legislation to ensure they are provided with feed and water immediately after hatch. Day-old chicks may actually be up to three days old, due to variation of hatching times in the same hatcher.



There is thus an evident need to provide a clear definition of a day-old chick - currently, the legislation defines day-old chicks as poultry less than 72 hours old, therefore the chicks may be deprived of feed and water for a considerable amount of time<sup>9</sup>. A day-old chick must be defined as a chick on the day of hatching, without the currently existing loophole of additional two days. This definition is needed both due to animal welfare and economic reasons - chicks who are fed and watered upon hatching have increased yolk uptake, improved gut quality, and higher processing weights than chicks who are fed after arriving at the farm<sup>10 11</sup>.

<sup>9</sup> Careghi, C., Tona, J., Onagbesan, O.M., Buyse, J., Decuypere, E., Bruggeman, V. (2005). The effects of the spread of hatch and interaction with delayed feed access after hatch on broiler performance until seven days of age. *Poultry Science*. 84(8):1314-20. 10.1093/ps/84.8.1314.

<sup>10</sup> Bhanja, S.K., Devi, C.A., Panda, A., Sunder, G.S. (2009). Effect of post hatch feed deprivation on yolk-sac utilization and performance of young broiler chickens. *Asian-Australasian Journal of Animal Sciences*. 2009, June;22(8): 1174-1179

<sup>11</sup> De Jong, I.C., van Riel, J., Bracke, M.B., van den Brand, H. (2017). A 'meta-analysis' of effects of post-hatch food and water deprivation on development, performance and welfare of chickens. *PLOS One*. 2017 Dec 13;12(12):e0189350.



## Domain 2: Physical Environment

### Policy recommendations

1. At least one nest for every six hens, covered with soft material allowing hens to sit on it, must be provided;
2. Rearing systems for male parent stock must comply with the conditions laid down in the [European Chicken Commitment](#) (ECC), until when specific housing conditions for parent stock will be developed;
3. Hens must be kept in single height barns: aviary systems must not have more than four tiers (i.e., maximum four tiers for aviary systems, no stacking of multi-tier modules allowed);
4. Any new barns must be provided with winter gardens (aka verandas) and/or outdoor areas;
5. Stocking density must not exceed 7 hens/m<sup>2</sup>. Density must be calculated on the basis of the usable area (i. e surface that is permanently available for the animals). Stocking density per floor area must be a maximum of 15 hens/m<sup>2</sup>. Nest sites cannot be included within the usable area. Winter gardens shall be a minimum 20% of the inside floorage and it cannot be used to calculate the stocking density;
6. Stocking density must not exceed 14 pullets/m<sup>2</sup>. As in the case of hens, the density must be calculated on the basis of the usable area (i. e surface that is permanently available for the animals);
7. The use of cages, including colony cages, 'combi systems' and other systems where hens may be confined within the aviary, is not allowed;
8. Hens must have access to natural light (at least 20 lux daylight) through daylight permeable surfaces (skylights, side windows and/or light wells with shutters to protect animals from sunlight), which are at least 3% of the ground surface of the enclosure. Light intensity in littered areas must be at least 60 lux at animal level. Light sources must be non-fluorescent or of a frequency of at least 100 Hz. Hens must be provided with an uninterrupted period of darkness of at least eight hours on a daily basis;
9. The following air quality parameters must be respected:
  - max 20 ppm ammonia,
  - CO<sub>2</sub> 3,000 ppm,
  - H<sub>2</sub>S 0,5 ppm,
  - Dust 10 mg/m<sup>3</sup>;
10. The use of electric wires in the living areas of hens (both building and winter garden) is forbidden.

The environment in which laying hens are kept must provide shelter from extreme temperatures, weather conditions, protect them from fear and distress and allow the exhibition of natural behaviour patterns. The following parameters have a direct impact on animal health and welfare, as well as on productivity: stocking density and housing; lighting regime; air quality; and temperature and humidity.

**Stocking density and housing:** Stocking rate is defined as the number of birds allowed or present per unit area<sup>15</sup>. In the case of laying hens, EU legislation defines a maximum number of birds per unit area that depends on the rearing system. Levels of aggression and injurious pecking behaviour and, in some cases, layer performance can be influenced by stocking density rates<sup>12</sup>. This is because laying hens carry out specific behaviours, such as feeding, or dustbathing all together at the same time<sup>13 14</sup>. It is hence crucial to consider two different values of stocking density - one per floor area and the other per usable area. Some authors have reported an increased risk of damp litter and plumage damage at higher stocking densities, and higher levels of corticosterone, a stress hormone<sup>15 16</sup>. Management factors appear to be important in mitigating the risk of injurious feather pecking and aggression if these behaviours are determined by stocking rates<sup>17</sup>. Some higher welfare standards mandate maximum stocking densities per usable area that are lower than the maximum included in the EU legislation (e.g. 6.7 birds/m<sup>2</sup> for Beter Leven 3 stars<sup>18</sup>; outside the EU, 7.15 birds per m<sup>2</sup> for Global Animal partnership steps 1 and 2<sup>19</sup>; 6.2 birds per m<sup>2</sup> for AGW Animal Welfare Approved<sup>20</sup>). The German label "Für mehr Tierschutz" (standard and premium) allows a maximum stocking density of 7 birds/m<sup>2</sup>, but as the mandatory veranda cannot be taken into account for the calculation of available surface, the real stocking density is approximately 5.5 birds/m<sup>2</sup><sup>21</sup>.

<sup>12</sup> Huo X., (2016). Effects of stocking density on feather pecking and aggressive behaviour in Thai crossbred chickens. *Agriculture and Natural Resources*. 2016, Sept; 50(5): 396-399.

<sup>13</sup> Toscano, M., Gomez, Y., Berezowski, J., Asher, L., & Völkel, B. (2019). Individuality of laying hens within large groups and the relationship with temporal space usage. In B. O'Brien, D. Hennessy, & L. Shalloo (Eds.), *Precision Livestock Farming 2019 - Papers Presented at the 9th European Conference on Precision Livestock Farming, ECPLF 2019* (pp. 890-893)

<sup>14</sup> Rufener, C., Berezowski, J., Maximiano Sousa, F. et al. Finding hens in a haystack: Consistency of movement patterns within and across individual laying hens maintained in large groups. *Sci Rep* 8, 12303 (2018).

<sup>15</sup> Kang, H. K., Park, S. B., Kim, S. H., & Kim, C. H. (2016). Effects of stock density on the laying performance, blood parameter, corticosterone, litter quality, gas emission and bone mineral density of laying hens in floor pens. *Poultry Science*, 95(12), 2764–2770.

<sup>16</sup> Steinfeldt, S., and B. L. Nielsen (2015) Welfare of organic laying hens kept at different indoor stocking densities in a multi-tier aviary system. II: live weight, health measures and perching. *Animal* 9:1518- 1528

<sup>17</sup> Zimmerman, P. et al. (2006) The effect of stocking density, flock size and modified management on laying hen behaviour and welfare in a non-cage system, *Applied Animal Behaviour Science*, Volume 101, Issues 1–2, 2006, Pages 111-124

<sup>18</sup> See <https://beterleven.dierenbescherming.nl/over-de-dieren/alle-dieren/legghennen/>

<sup>19</sup> Global Animal Partnership's (2017) 5-Step® Animal Welfare Rating Pilot Standards for Laying Hens v1.0.

<sup>20</sup> See <https://agreenerworld.org/certifications/animal-welfare-approved/standards/laying-hen-standards/>

<sup>21</sup> See <https://www.tierschutzlabel.info/richtlinien#c201>

LEI Wageningen calculated that husbandry systems should not exceed 4.5 birds/m<sup>2</sup> regarding usable area if birds are to be provided with the opportunity to perform their full behavioural repertoire<sup>22</sup>. Currently, EU legislation regulates stocking density based on usable area, but lacks provisions on stocking density at floor level. The revised animal welfare legislation must include both these values to be able to meet the needs of laying hens farmed in cage-free systems. The stocking density based on usable area must not exceed 7 hens/m<sup>2</sup> and the stocking density at floor level must not exceed 15 hens/m<sup>2</sup>.



Research shows that group nests are more likely to be used when they have a non-transparent front curtain, and the other three sides are enclosed<sup>23</sup>. Sliced curtains allow for the hens to investigate the entire length of the nest<sup>24</sup>. Hens are known to prefer smaller group nests (0.43m<sup>2</sup>) compared with larger ones (0.86m<sup>2</sup>)<sup>25</sup>. In comparative studies, more hens use the smaller nests, spend longer in them, visit less frequently per egg, and lay more eggs in them, compared with the larger nests. Central partitions can make group nests more attractive<sup>26</sup>.

**Requirements for winter gardens:** Winter gardens shall be a minimum 20% of the inside floorage and their surface cannot be used to calculate the stocking density. The structures/shelters are designed in such a way that the behaviour and needs of the chickens are taken into account. The planting/equipping is done in such a way that the chickens can cross open areas and a type of shelter can be reached within 20 metres of any place in the run.

<sup>22</sup> Wageningen UR project team Houden van Hennen (2004) Laying Hen Husbandry – towards a happy hen life, proud farmers and a satisfied society. Wageningen – Lelystad, Wageningen UR.

<sup>23</sup> Buchwalder, T., Fröhlich, E. (2011). Assessment of colony nests for laying hens in conjunction with the authorization procedure. *Applied Animal Behaviour Science*. 2011, Oct;134(1-2): 64-71.

<sup>24</sup> Stampfli, K., Buchwalder, T., Fröhlich, E.K.F., Roth, B.A. (2013). Influence of front curtain design on nest choice by laying hens. *British Poultry Science*. 2013, Jan;53(5): 553-560.

<sup>25</sup> Ringgenberg, N., Fröhlich, E.K.F., Harlander-Matauschek, A., Wurbel, H. Roth, B.A. (2014) Does nest size matter to laying hens? *Applied Animal Behaviour Science*. 2014, March;155: 66-73.

<sup>26</sup> Ringgenberg, N., Fröhlich, E.K.F., Harlander-Matauschek, A., Toscano, M.J., Wurbel, H. Roth, B.A. (2015). Nest choice in laying hens: Effects of nest partitions and social status. *Applied Animal Behaviour Science*. 2015, Aug;169: 43-50.

A run does not have to be fully planted/equipped, strips along which the chickens can walk can also be created. Planting/equipping may consist of perches, trees, shrubs, corn, wooded bank, uprooted trees, sewage pipes, etc. This also serves as shelter during the winter. The covered run is a cold, covered roaming area, which is directly connected to the enclosure via run openings to which all animals have easy access (by 10 AM at the latest, the hens shall have access to the covered run for an uninterrupted period of at least eight hours). Ideally access to this covered run should be unrestricted. The cold roaming area must be clearly lighter than the interior of the enclosure, must have an outdoor climate, and be protected against weather influences in such a way that it can also be used during bad weather (e.g. by installing windbreak/ventilation mesh) and during housing orders due to outbreaks (e.g. HPAI). The covered run is located along the entire length of the long side(s) of the enclosure. The distance from the furthest point in the enclosure to the covered run does not exceed 15 m. Enclosures that have run openings on one side (lengthwise), are not wider than 15 m. The covered run is separated from the enclosure by a full wall containing run openings. Openings to the covered run are at least 35 cm high and 40 cm wide. At least 2 m of passage opening must be available for every 1,000 chickens. The construction of the covered run, including the roof, prevents condensation formation and excessively high temperatures. The long side of the covered run is at least 70% daylight and air permeable in any case.



The covered run is at least 2 m high everywhere. Starting at the beginning of the laying period, the covered run is covered by a layer of litter at least 2 cm thick. There is no mention of electric wire fencing in the Laying Hens Directive. It is, in theory, covered in Annex 8 of the General Farming Directive but it should be explicitly banned in the new animal welfare legislation.

Currently, hens are not required by the Laying Hens Directive to have access to outdoors, and the restrictions only apply to those systems that provide it. It is necessary to stipulate in the revised legislation that any new barns must be provided with winter gardens (aka verandas) and/or outdoor areas, and the hens shall have access to the covered run for an uninterrupted period of at least eight hours.

**Lighting regime:** The Laying Hens Directive states that the lighting pattern for laying hens must “include an adequate uninterrupted period of darkness lasting, by way of indication, about one third of the day, so that the hens may rest”. Higher welfare schemes typically mandate minimum continuous periods and levels of (natural) light alternated with these minimum continuous periods of darkness<sup>27</sup>. This is because while daylight encourages certain active behaviours, a sufficient period of uninterrupted darkness is needed for resting<sup>28 29 30</sup>. Systems with outdoor access or covered verandas can help ensure exposure to natural daylight. Currently, the Laying Hens Directive does not require hens to have access to natural light. The revised animal welfare legislation needs to stipulate that all hens must have access to natural light. The Directive needs to include specific wording regarding light intensity. The current wording regarding the duration of darkness is vague and may lead to misinterpretation. The wording needs to be updated to ensure that all hens have at least 8 hours of uninterrupted darkness every 24 hours.



<sup>27</sup> <http://bit.ly/2BE6TRI>; criteria developed in collaboration with the Deutscher Tierschutzbund

<sup>28</sup> Malleau A., Duncan I., Widowski T., Atkinson, J. (2007). The importance of rest in young domestic fowl. *Applied Animal Behaviour Science - APPL ANIM BEHAV SCI*. 106. 52-69.

<sup>29</sup> Duve, L.R.; Steinfeldt, S.; Thodberg, K.; Nielsen, B.L. (2011). Splitting the scotoperiod: effects on feeding behaviour, intestinal fill and digestive transit time in broiler chickens. *British Poultry Science*, 52(1), 1–10. doi:10.1080/00071668.2010.549671

<sup>30</sup> A.L. Geng, Y. Zhang, J. Zhang, H.H. Wang, Q. Chu, Z.X. Yan, H.G. Liu, Effects of light regime on circadian rhythmic behavior and reproductive parameters in native laying hens, *Poultry Science*, Volume 101, Issue 5, 2022

**Air quality:** The parameters of ventilation systems are not normally specified in higher welfare schemes, but targets for air quality parameters are (e.g. ammonia -generally 20ppm; dust – generally 10mg per m<sup>3</sup>; and in some cases<sup>31</sup>, carbon dioxide and carbon monoxide). Air quality (presence of dust, endotoxins from bacteria, ammonia, etc.) influences not only animal health, but also the environmental impact of the farm, the health of operators and public health in general, as particulate matter can escape from farms and contaminate the air. Aviary systems with belt removal of manure often manage to maintain better air quality compared to systems with manure pits as in most single deck housing<sup>32 33 34</sup>. However, depending on outside temperature, maintaining good air quality parameters can be problematic irrespective of housing system<sup>35</sup>. Currently, there is no mention of air quality parameters in the Laying Hens Directive, nor in the General Farming Directive. The revised animal welfare legislation needs to include these air quality parameters.

**Temperature and humidity:** Temperature and humidity are important for the thermal comfort of laying hens as well as for air quality. Hens are comfortable between 18 and 27 degrees Celsius<sup>36</sup>, with a thermo-neutral zone (in which they are very comfortable) for healthy animals between 20-25 degrees Celsius<sup>17</sup>. Adequate ventilation (either natural or forced) is essential to ensure that excessive heat, odours, and humidity are removed from the hen house. Heating should be used in colder climates, as below 10 degrees Celsius hens start suffering from cold stress (ibid.). These considerations also apply to mobile sheds used in small-scale free-range or organic farming systems, which should additionally ensure good insulation<sup>37</sup>. Currently, there is no reference to temperature or humidity in the Laying Hens Directive. The revised legislation must include provisions on these two parameters.

<sup>31</sup> DEFRA (2018) Code of practice for the welfare of laying hens and pullets

<sup>32</sup> David, B., Mejdell, C., Michel, V., Lund, V., & Moe, R. O. (2015). Air Quality in Alternative Housing Systems may have an Impact on Laying Hen Welfare. Part II-Ammonia.

<sup>33</sup> Green A.R., Wesley I., Trampel D.W., Xin H. Air quality and bird health status in three types of commercial egg layer houses. *J. Appl. Poult. Res.* 2009;18:605–621.

<sup>34</sup> Li H., Xin H., Liang Y., Burns R.T. Reduction of ammonia emissions from stored laying hen manure through topical application of zeolite, Al + Clear, ferix-3, or poultry litter treatment. *J. Appl. Poult. Res.* 2008;17:421–431.

<sup>35</sup> Nicol, C.J., Bouwsema, J., Caplen, G., Davies, A.C., Hockenhull, J., Lambton, S.L., Lines, J.A., Mullan, S., Weeks, C.A (2017). Farmed Bird Welfare Science Review. Department of Economic Development, Jobs, Transport and Resources. Victoria, Australia. 2017.

<sup>36</sup> de Lauwere, C. C., Luttik, J. (2004). Laying Hen Husbandry – towards a happy hen life, proud farmers and a satisfied society. Wageningen – Lelystad, Wageningen UR. 2004.

<sup>37</sup> DEFRA (2011). The welfare of hens in free-range systems. Gov. UK, 2011.



## Domain 3: Health

### Policy recommendations

1. Beak trimming is not permitted;
2. Forced moulting is not permitted;
3. Restrictions are needed on the breeds used in commercial systems and the focus on productivity at the cost of the hen's welfare. Low welfare breeds must be forbidden.

### Explanation

Good health is the basis of a happy life full of positive experiences. There is no place for painful mutilations within a good life, however, beak trimming is currently performed widely across the EU as a means to prevent outbreaks of injurious feather pecking and cannibalism, and sometimes to reduce food wastage in adult birds<sup>38</sup>. Furthermore, there is no policy on breeds in place, despite the vast body of science proving that genetics greatly influence the hen's health and welfare<sup>39 40 41 42</sup>.

**Mutilations and forced practices:** The origin of injurious feather pecking is multi-faceted, but it can be triggered by frustration caused by poor housing conditions<sup>43</sup>, excessive stocking density<sup>44</sup>, factors relating to the pullet rearing

<sup>38</sup> Hughes, B.O., Gentle, M.J. (1995). Beak trimming of poultry: its implications for welfare. *World's Poultry Science Journal*. 1995;51(1): 51-61.

<sup>39</sup> Fernyhough, M., Nicol, C.J., van de Braak, T. et al. The Ethics of Laying Hen Genetics. *J Agric Environ Ethics* 33, 15–36 (2020).

<sup>40</sup> Stratmann, A., Fröhlich, E. K., Gebhardt-Henrich, S. G., Harlander-Matauschek, A., Würbel, H., & Toscano, M. J. (2016). Genetic selection to increase bone strength affects prevalence of keel bone damage and egg parameters in commercially housed laying hens. *Poultry Science*, 5, 975–984.

<sup>41</sup> Su, G., Kjaer, J. B., & Sørensen, P. (2005). Variance components and selection response for feather-pecking behavior in laying hens. *Poultry Science*, 84, 14–21.

<sup>42</sup> De Haas, E. N., Bolhuis, E., de Jong, I. C., Kemp, B., Janczak, A. M., & Rodenburg, T. B. (2014a). Predicting feather damage in laying hens during the laying period. Is it the past or is it the present? *Applied Animal Behaviour Science*, 160, 75–85.

<sup>43</sup> Rodenburg, T. B. VAN Krimpen, M.M., De Jong, I.C., De Haas, E.N., Kops, M.S., Riedstra, B.J., Nordquist, R.E., Wagenaar, J.P., Bestman, M., Nicol, C.J. (2013). The prevention and control of feather pecking in laying hens: Identifying the underlying principles. *World's Poultry Science Journal*. 2013, June;69: 361–374.

<sup>44</sup> Rodenburg, T. B. VAN Krimpen, M.M., De Jong, I.C., De Haas, E.N., Kops, M.S., Riedstra, B.J., Nordquist, R.E., Wagenaar, J.P., Bestman, M., Nicol, C.J. (2013). The prevention and control of feather pecking in laying hens: Identifying the underlying principles. *World's Poultry Science Journal*. 2013, June;69: 361–374.

phase<sup>45</sup>, genetic line<sup>46</sup>, housing system and management<sup>47</sup>, diet composition<sup>48</sup>, opportunity to forage<sup>49 50</sup> and health status. The presence of feather pecking in a flock should be verified by regularly assessing plumage condition and cover. Methods to assess feather cover and specific advice on how to improve it have been published, for instance, by AssureWel<sup>51</sup>. Although loss of plumage cover can also be an indication of abrasion against structural elements of the housing, this specific type of abrasion is more frequent in cages than in cage-free systems<sup>52</sup>. As prevention is possible through non-invasive methods, it is unacceptable to prevent feather pecking through cruel mutilations. The painful beak-trimming procedure is performed without anaesthetic and causes tissue damage, nerve injury, open wounds and bleeding<sup>53 54</sup>. No analgesics are given to alleviate the long-term pain<sup>55</sup> following the procedure.

Beak trimming needs to be banned, but the systems also need to be improved to ensure that feather pecking and cannibalism do not occur. Countries such as Sweden, Denmark, Austria and the Netherlands have banned beak trimming with success, and associations such as KAT<sup>56</sup> (present in Germany and some neighbouring countries) also introduced such requirements, effectively changing the methods of managing feather pecking in whole countries. Currently, the Laying Hens Directive allows beak trimming in certain cases. This procedure must be explicitly banned in the revised legislation, as there is a substantial body of knowledge covering non-invasive preventative measures.

<sup>45</sup> Hofmann, T., Schmucker, S., Grashorn, M., & Stefanski, V. (2021). Short- and long-term consequences of stocking density during rearing on the immune system and welfare of laying hens. *Poultry Science*, 100(8), 101243.

<sup>46</sup> Kjaer, J. & Hocking, Paul. (2004). The genetics of feather pecking and cannibalism. 109-121.

<sup>47</sup> Coton, J., Guinebretière, M., Guesdon, V., Chiron, G., Mindus, C., Laravoire, A., Pauthier, G., Balaine, L., Descamps, M., Bignon, L., Huneau-Salaün, A., & Michel, V. (2019). Feather pecking in laying hens housed in free-range or furnished-cage systems on French farms. *British Poultry Science*, 60(6), 617–627.

<sup>48</sup> Patt, Antonia & Halle, Ingrid & Dudde, Anissa & Olbrich, Andrea & Sieburg-Rockel, Jördis & Krause, E. Tobias. (2022). Influence of different dietary fibre contents in the diet on feather pecking, locomotor activity and performance of laying hens. *British Poultry Science*.

<sup>49</sup> Aerni, V., El-Lethey, H., & Wechsler, B. (2000). Effect of foraging material and food form on feather pecking in laying hens. *British Poultry Science*, 41(1), 16–21.

<sup>50</sup> El-Lethey, Heba & Aerni, V. & Jungi, T.W. & Wechsler, Beat. (2000). Stress and feather pecking in laying hens in relation to housing conditions. *British Poultry Science*. 41. 22-8.

<sup>51</sup> <http://www.assurewel.org/>

<sup>52</sup> Nicol, C.J., Bouwsema, J., Caplen, G., Davies, A.C., Hockenhull, J., Lambton, S.L., Lines, J.A., Mullan, S., Weeks, C.A (2017). Farmed Bird Welfare Science Review. Department of Economic Development, Jobs, Transport and Resources. Victoria, Australia. 2017.

<sup>53</sup> Dennis, R.L., Cheng, H.W. Effects of different infrared beak treatment protocols on chicken welfare and physiology. *Poultry Science*. 2012, June;91(7): 1499—1505.

<sup>54</sup> Cheng, H. (2006). Morpho-pathological changes and pain in beak trimmed laying hens. *World's Poultry Science Journal*. 2006; 62(1): 41-52.

<sup>55</sup> Gentle M.J. Pain issues in poultry. (2011) *Appl. Anim. Behav. Sci.* 135:252–258.

<sup>56</sup> <https://www.was-steht-auf-dem-ei.de/en/kat-association/index.php>

Furthermore, the General Farming Directive states that "all 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" and that "All animals must have access to feed at intervals appropriate to their physiological needs". This in principle, rules out the permission of forced moulting by feed restriction, however the revised animal welfare legislation needs to specifically forbid the practice, to avoid misinterpretation or exploitation. Currently, other methods for forced moulting, such as light restriction and chemical agents may also be used, and so the Directive needs to explicitly ban forced moulting by any means.

**Breeding:** Intensive genetic selection for high egg production has resulted in a number of related welfare issues<sup>57</sup>. Breed differences are apparent in certain parameters including fearfulness<sup>58</sup>, susceptibility to bone fractures<sup>59</sup> and feather cover<sup>60</sup>, and these concerns are present, to varying degrees, in all breeds<sup>61</sup>. Selective breeding for high productivity has meant that the commercial layer requires more calcium for egg shell production than the medullary bone can supply. Consequently, structural bones become utilised in egg production, and become osteoporotic and fragile. Osteoporosis, due to mineral depletion, is exacerbated by the inability to exercise, and can be caused by nutritional inadequacy. The problem, however, is principally genetic in origin<sup>62</sup>. Osteoporosis is caused by breeding energetically efficient, lightweight birds who are able to maintain a high rate of lay over a prolonged period of time<sup>63</sup>. Skeletal fragility is a production disease and is likely to be a side-effect of selecting for high productivity. It is not found in unselected lines, or in heritage breeds<sup>64</sup>.



<sup>57</sup> Nicol, C.J. (2015). Genetics and domestication. In *The behavioural biology of chickens* (pp. 1–14). CABI: Oxford, UK, 2015.

<sup>58</sup> Uitdehaag, K.A., Komen, H., Rodenburg, T.B., Kemp, B., van Arendonk, J.A.M. (2008). The novel object test as predictor of feather damage in cage-housed Rhode Island Red and White Leghorn laying hens. *Applied Animal Behaviour Science*. 2008;109(2-4): 292-305.

<sup>59</sup> Candelotto, L., Stratmann, A., Gebhardt-Henrich, S. G., Rufener, C., van de Braak, T., & Toscano, M. J. (2017). Susceptibility of keel bone fracture in laying hens and the role of genetic variation. *Poultry Science*. 2017 Oct 1;96(10):3517-3528.

<sup>60</sup> Mullan, S. M., Szymaragd, C., Wrathall, J. H. M., Cooper, M., Jamieson, J., Bond, A., Atkinson, C., Main, C. (2016). Animal welfare initiatives improve feather cover of cage-free laying hens in the UK. *Animal Welfare*. 2016 May;25(2): 243–253.

<sup>61</sup> Fernyhough, M., Nicol, C.J., van de Braak, T., Toscano J.M. (2020). The Ethics of Laying Hen Genetics. *Journal of Agriculture and Environmental Ethics*. 2020 Feb;33: 15–36.

<sup>62</sup> Fleming, R. H., McCormack, H. A., McTier, L., Whitehead, C.C. (2006). Relationships between genetic, environmental and nutritional factors influencing osteoporosis in laying hens. *British Poultry Science*. 2006 Dec;47(6):742–755.

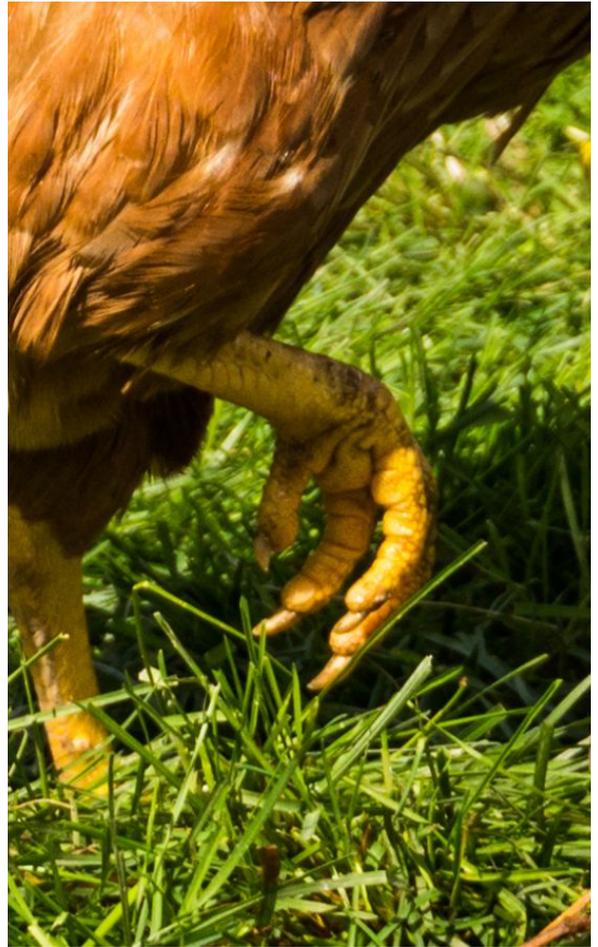
<sup>63</sup> Whitehead, C.C. (2004). Overview of bone biology in the egg-laying hen. *Poultry Science*. 2004 Feb;83(2):193-199.

<sup>64</sup> Budgell K.L. Silversides F.G. (2004). Bone breakage in three strains of end-of-lay hens. *Canadian Journal of Animal Science*. 2004 Dec;84(4): 745-747.

Susceptibility to osteoporosis is moderately to strongly heritable<sup>65</sup>, and it is possible to selectively breed for stronger bones<sup>66</sup>.

The robustness of layers is even more important as we move away from cages, as more injuries will result if their breeding is not improved. The production of large and extra large eggs by small birds can lead to cloacal prolapse (where the outer end of the reproductive tract fails to retract after egg laying)<sup>67</sup>. The muscle elasticity can become inadequate after a hen has laid many eggs, particularly large ones. The prolapse can also encourage other hens to peck at the prolapsed part of the oviduct, causing haemorrhages, infection, cannibalism and death<sup>30</sup>.

The hormonal activity associated with heavy egg production can predispose hens to salpingitis (inflammation of the reproductive tract caused by bacterial *E.coli* infection). This can also cause further complications and death in hens<sup>68</sup>.



Genetic companies are currently targeting extended laying cycles in hens. Extended laying periods reduce the number of required replacement birds, and may have benefits to welfare if the hen's extended life is characterised by good welfare. To be able to continue to produce for a longer period, the layer hen must be sufficiently robust, and so there is potential for this focus to improve the breeds used<sup>62</sup>.

Selecting for docile birds, or even poor-sighted birds, to reduce injurious pecking only masks the original issues causing the behaviour, and is likely to introduce other welfare issues<sup>62</sup>. It is however important to recognize the influence of genetic makeup on

<sup>65</sup> Bishop, S.C., Fleming, R.H., McCormack, H.A., Flock, D.K., Whitehead, C.C. (2000). Inheritance of bone characteristics affecting osteoporosis in laying hens. *British Poultry Science*. 2000 June;41(1): 33–40.

<sup>66</sup> Stratmann, A., Fröhlich, E.K.F., Gebhardt-Henrich, S.G., Harlander-Matauschek, A., Würbel, H., Toscano, M.J. (2016). Genetic selection to increase bone strength affects prevalence of keel bone damage and egg parameters in commercially housed laying hens. *Poultry Science*. 2016 May;95(5):975-984.

<sup>67</sup> Ray, Subhasish & Swain, Partha & Amin, Rooh & Nahak, Anil & Sahoo, Saroj & Rautray, Amiya & Mishra, Akash. (2013). Prolapse in laying hens: its pathophysiology and management: A Review. *Indian Journal of Animal Production and Management*. 2013;29(3-4): 17-24.

<sup>68</sup> Poulsen, L. L., Kudirkiene, E., Jørgensen, S. L., Djordjevic, S. P., Cummins, M. L., Christensen, J. P., Christensen, H., Bisgaard, M., & Thøfner, I. (2020). Whole genome sequence comparison of avian pathogenic *Escherichia coli* from acute and chronic salpingitis of egg laying hens. *BMC Veterinary Research*. 2020, May;16(1): 148.

aggression<sup>69</sup>, and therefore the need to manage detrimental behaviours such as feather pecking. There is no candidate for the "higher welfare breed" at the moment, but such a breed would be expected to achieve: frequent ranging behaviour; positive social interactions; good health outcomes; low levels of injurious pecking; and low levels of keel bone disorder.

Genetic improvements within current commercial lines would not be able to create a higher welfare breed, only reduce these problems by degree<sup>24</sup>. Some guidance can be provided by the breeds included in the Global Animal Partnership (GAP) study<sup>70</sup> as well as breeds recommended by the European Chicken Commitment<sup>71</sup>. Recognizing the vast influence of the breed on the welfare and performance of the animal, it is imperative to include provisions on breeding in the revised animal welfare legislation, as currently there are no such mentions. Such provisions could be laid out as a positive or negative list, or as an updatable list of acceptable breeds. The welfare of the animal must be prioritised over productivity, in view of the aforementioned references explaining the negative impact of the genetic makeup of highly productive breeds on their health and welfare.

<sup>69</sup> Nie, C., Ban, L., Ning, Z., & Qu, L. (2019). Feather colour affects the aggressive behaviour of chickens with the same genotype on the dominant white (I) locus. *PLOS One*, 14(5), e0215921.

<sup>70</sup> GAP. Laying hens standards. Accessed on: 25th Feb. 2022. Available at <https://globalanimalpartnership.org/standards/laying-hen/>

<sup>71</sup> European Chicken Commitment. Accessed on: 25th Feb. 2022. Available at <https://welfarecommitments.com/europeletter/>



## Domain 4: Behavioural Interactions

### Policy recommendations

1. Perches (at least 18 cm perching space/hen) must always be provided;
2. Litter: The substrate used in bedding must be sufficient (depth of at least 10 cm), clean and it must promote the expression of the exploration behaviour (scratching and pecking) and dust bathing behaviour;
3. Pecking blocks (at least 2 per 1,000 hens) must be provided;
4. Areas equipped for dust bathing with at least 3.5m<sup>2</sup> in groups of hens up to 1,000 hens must be provided. The area must have substrate adequate for dustbathing behaviour and must be maintained in an appropriate condition. In houses with more than 1,000 hens, dust bathing areas must be adjusted accordingly to the proportion of 20.9m<sup>2</sup>/6,000 hens;
5. Straw, hay, or compressed alfalfa bales, or other suitable pecking substrates must be provided. Minimum 2 per 1,000 hens. Replaced when floor level or 10% remains;
6. End-of-lay hens must be caught by trained staff, holding a certificate by the Competent Authority. Hens must be handled upright with support around their wings (i. e. the Swedish method);
7. Provisions are needed for the harvesting systems of chicks at the hatcheries and of the pullets at the pullet farms to minimise short and long-term stress, physical damage, and fearfulness. The time of constraint for chicks should be kept to the minimum;
8. On-farm hatching should be phased in to remove the need for stressful transportation and improve chick health;
9. Day-old chicks must be handled carefully and placed in an appropriate environment;
10. Where conveyor belt systems are used to move/harvest chicks, they must be designed to ensure that chicks cannot become trapped, and have adequate side protection to prevent falls. When chicks are transferred between levels, the angle of the conveyor belt must not cause the birds to lose balance.

### Explanation

The environment plays a crucial role in the welfare of chickens<sup>72</sup>, providing them with not only shelter but opportunities to express their needs and behaviours.

<sup>72</sup>Dawkins M.S, Donnelly C.A, Jones T.A. (2004) Chicken welfare is influenced more by housing conditions than by stocking density. *Nature*. 2004 Jan;427(6972):342-4.

Both handling and environmental enrichments are important factors influencing laying hen welfare.

**Enrichment:** Providing enrichment (perches, litter, pecking blocks, dust bathing facilities or bales) throughout the life of the laying hen has been proved in numerous studies to be key in the safeguarding of good welfare<sup>73 74</sup>. Perching is an activity proved to be of high priority for laying hens<sup>75</sup>, thus the need for adequate perches is evident. Accordingly, Australian and UK RSPCA welfare standards<sup>76</sup> require pecking and/or foraging enrichments for pullets. However, there is currently no requirement for



pecking blocks, dust bathing facilities or bales in any of the systems permitted in the Directives. In the revised animal welfare legislation, these aspects need to be addressed, stipulating the forms of enrichment required and how they should be maintained and provided. The requirement for one pecking object per 1,000 birds must be added as well<sup>77</sup>. Pecking objects can include peck-a-blocks, brassicas, and hanging wooden blocks<sup>78</sup>. Scatter feeding can be an effective form of enrichment, as it encourages the birds to perform natural foraging behaviours. Scatter feeding can be an effective form of enrichment, as it encourages the birds to perform natural foraging behaviours. The feed must be a good quality food pellet that does not break up. Studies prove that environmental enrichment is crucial to reduce injurious

<sup>73</sup> D.L.M. Campbell, E.N. de Haas, C. Lee, A review of environmental enrichment for laying hens during rearing in relation to their behavioral and physiological development, *Poultry Science*, Volume 98, Issue 1, 2019, Pages 9-28

<sup>74</sup> Jones, R.B.; Carmichael, N.L.; Rayner, E. Pecking preferences and pre-dispositions in domestic chicks: Implications for the development of environmental enrichment devices. *Appl. Anim. Behav. Sci.* 2000, 69, 291–312

<sup>75</sup> Giersberg MF, Spindler B and Kemper N (2019) Linear Space Requirements and Perch Use of Conventional Layer Hybrids and Dual-Purpose Hens in an Aviary System. *Front. Vet. Sci.* 6:231.

<sup>76</sup> RSPCA welfare standards for pullets (2018)

<sup>77</sup> D.L.M. Campbell, E.N. de Haas, C. Lee, A review of environmental enrichment for laying hens during rearing in relation to their behavioral and physiological development, *Poultry Science*, Volume 98, Issue 1, 2019, Pages 9-28

<sup>78</sup> M. Zepp, H. Louton, M. Erhard, P. Schmidt, F. Helmer, A. Schwarzer. The influence of stocking density and enrichment on the occurrence of feather pecking and aggressive pecking behavior in laying hen chicks. *J. Vet. Behav.*, 24 (2018), pp. 9-18

pecking<sup>79</sup>.

The current requirement in the Directive of 250 cm<sup>2</sup> of littered area per hen equates to around one third of the floor using the existing stocking densities. With the updated stocking densities, this will decrease the amount of litter required per m<sup>2</sup> overall. The wording should, therefore, be updated to state that one third of the floor should be covered in litter or that at least 320 cm<sup>2</sup> of littered area is provided per hen<sup>80</sup>. The Directive needs to be updated to include the requirement for litter to be of sufficient depth. An Article needs to be added to the Directive to stipulate the forms of enrichment required and how they should be maintained and provided.

**Handling:** This is relevant in both the Laying Hens Directive and in the Council Regulation 1/2005 (Transport Regulation), and so possibly different wording is required for both. Currently in the Laying Hens Directive, there is nothing about how hens should be handled, and this important aspect is only covered in very general terms in the Transport Regulation. In fact, despite the Transport Regulation requires to provide appropriate facilities to keep, feed, and water animals in case of loading and unloading operations lasting more than four hours, poultry remain excluded from such provision. There is no restriction for journey length for poultry in the Transport Regulation. The Transport Regulation needs to be updated to include max 4 hours journey time for the transport of poultry. Commercial hatcheries are known to expose laying hen chicks to considerable stress. Consequently, chicks from commercial hatcheries are more fearful in their first weeks of life, and are less able to cope with handling, compared with control chickens who are not exposed to commercial hatchery processes. Later on, they have more feather damages and injuries on combs and wattles, compared with the control chickens<sup>81</sup>. High speed conveyor belts, excessive drop heights, and too high acceleration can all cause physical and mental welfare issues<sup>82</sup>.



<sup>79</sup> Nicol C.J., Lindberg A.C., Phillips A.J., Pope S.J., Wilkins L.J., Green L.E. Influence of prior exposure to wood shavings on feather pecking, dustbathing and foraging in adult laying hens. *Appl. Anim. Behav. Sci.* 2001;73:141–155

<sup>80</sup> Rufener, C., Berezowski, J., Maximiano Sousa, F., Abreu, Y., Asher, L., & Toscano, M. J. (2018). Finding hens in a haystack: Consistency of movement patterns within and across individual laying hens maintained in large groups. *Scientific Report*, 8(1), 12303

<sup>81</sup> Hedlund, L., Whittle, R., Jensen, P. (2019). Effects of commercial hatchery processing on short- and long-term stress responses in laying hens. *Scientific Report*. 2019 Feb;9(2367).

<sup>82</sup> Giersberg, M.F., Molenaar, R., Pieters, R., Boyer, W., Bas Rodenburg, T. (2020). Effects of drop height, conveyor belt speed, and acceleration on the welfare of broiler chickens in early and later life. *Poultry Science*. 2020 Dec;99(12): 6293-6299.

Fertilised eggs are transported to the farm before they are hatched. This means that hatched chicks do not need to be handled and transported, and can have access to feed and water straight away. There are numerous benefits to the farmer of on-farm hatching, including improved growth performance and body weight in the first few weeks<sup>83 84</sup>, lower prevalence of footpad dermatitis<sup>85</sup>, and lower total mortality<sup>35</sup>, compared with chicks who were hatched in hatcheries and transported to the farm.

<sup>83</sup> de Jong, I. C., van Hattum, T., van Riel, J.W., De Baere, K., Kempen, I., Cardinaels, S., Gunnink, H. (2020). Effects of on-farm and traditional hatching on welfare, health, and performance of broiler chickens. *Poultry Science*. 2020 Oct;99(10): 4662–4671.

<sup>84</sup> Hollemans, M.S., de Vries, S., Lammers, A., Clouard, C. (2018). Effects of early nutrition and transport of 1-day-old chickens on production performance and fear response. *Poultry Science*. 2018 July;97(7): 2534–2542.

<sup>85</sup> de Jong, I.C., Gunnink, H., van Hattum, T., van Riel, J.W., Raaijmakers, M., Zoet, E.S., van den Brand, H. (2019). Comparison of performance, health and welfare aspects between commercially housed hatchery-hatched and on-farm hatched broiler flocks. *Animal*. 2019 Jun;13(6): 1269–1277.



## Domain 5: Mental Experiences

### Policy recommendations

Revising the EU animal welfare legislation to make sure that all the recommendations provided in the previous paragraphs are well implemented and enforced.

### Introduction

The overall mental experience is the result of conditions under the four physical domains, comprising a range of positive and negative experiences including hunger, pleasure, comfort, pain, control, sickness, frustration, novelty, and affection. Positive mental experiences are fundamental for a good life for hens, and meeting standards across the four physical domains is the most comprehensive way to achieve this goal<sup>86</sup>.

### General requirements

Training programmes and welfare management plans explicitly assess the Domain 5 impacts of common and expected circumstances during farming and demonstrate a good life for laying hens<sup>87</sup>.

### Explanation

“The first four domains focus attention on factors that give rise to specific negative or positive subjective experiences (affects), which contribute to the animal’s mental state, as evaluated in Domain 5”<sup>88</sup>. The overall mental experience is the result of conditions under the first four domains, comprising a range of positive and negative experiences including hunger, pleasure, comfort, pain, control, sickness, frustration, novelty, and affection. Positive mental experiences are fundamental for a good life for laying hens.

<sup>86</sup> Eurogroup for Animals. (2021). *No Animal Left Behind: The need for a new Kept Animals Regulation*

<sup>87</sup> Eurogroup for Animals’ recommendation

<sup>88</sup> Mellor, J.D, et al (2020). Op. cit.

An animal's positive mental state is dependent on whether the standards for each of the physical domains are enforced. Although the controls performed by the authorities can ensure that this is enforced, another proactive way to increase the probability of compliance is to have requirements for horizontal management practices including training, planning, record keeping, assessments and continuous improvement.

## Training

Owners are responsible for ensuring all parties carrying out, supervising, and being responsible for (workers, owners and managers) the keeping of laying hens receive a substantial period of training appropriate to their responsibilities, including practical experience as well as continued training. Competent authority personnel shall also be trained appropriately. Personnel should be able to recognise whether or not the hens are in good health, understand the significance of behavioural changes, and appreciate the suitability of the environment for the hens' welfare. Necessary competence shall be documented through practical and theoretical training. The training shall:

- A. Be performed by a veterinarian or other person with equivalent competence in laying hen welfare;
- B. Contain at least the following elements:
  - 1. The relevant legal provisions;
  - 2. Natural needs, behaviour and physiology of the species, including how laying hens respond to pain, stress and disease;
  - 3. Welfare indicators including normal behaviour, environmental factors, signs of disease and poor welfare;
  - 4. Methods for inspection of laying hens;
  - 5. Production conditions that are important for laying hens welfare;
  - 6. Best handling practices;
  - 7. Operation and maintenance of equipment;
  - 8. Environmental enrichment;
  - 9. Systems for management of water supply and quality control;
  - 10. Methods for the management of situations frequently encountered during the containment of laying hens;
  - 11. Methods for the management of unforeseen events including the design and implementation of contingency plans.
- C. Be repeated as needed and at least every five years.

Every farm shall have a welfare management plan approved by a veterinarian. Among other things, it shall:

- A. Identify critical control points;
- B. Provide an overview of animal welfare measures that are relevant to implement to prevent outbreaks of infectious disease;
- C. Specify the necessary competent personnel to be present for certain procedures.

An updated contingency plan must be available at all times to contribute to safeguarding laying hen welfare in crisis situations. Among other things, it shall:

- A. Identify critical control points;
- B. Propose corrective measures;
- C. Indicate when to discontinue procedures in order to maintain adequate laying hen welfare;
- D. Address common handling practices;
- E. Plan for unforeseen events that may have an impact on procedures or hen welfare adapted to the farm.



## Record-keeping

The stockkeeper is responsible for keeping on-farm operating records which must be available to the competent authority for four years and operational facilities must have the records available for inspection. Records will allow traceability of flocks of laying hens including back to the production of the eggs. Records shall at least contain updated information on:

- A. Number of laying hens and origin farm;
- B. Number of eggs produced;
- C. Stocking density;
- D. Air quality measures;
- E. Feeding times and quantities;
- F. Water provision;
- G. Instances of use of medications;
- H. Instances of handling;
  - I. Mortality and morbidity, including time of the incidence, the cause of and any diseases diagnosed;
- J. Results of completed health checks: number of completed health checks, sampling, examinations performed, diagnoses and completed treatments.

## Assessments

The person responsible for day-to-day operations shall ensure that inspections are carried out with matters of importance to the welfare of the laying hens, including inspections of installations, technical facilities, equipment for production, air, enrichment materials and dustbathing substrats and the animals. The assessments must be carried out at least twice a day. In the event of abnormal behaviour or the risk of significant stress, the person responsible for their care shall act promptly to establish the cause and take remedial action, if necessary, with the assistance of a veterinarian or other expert.



## Continuous improvement

For a continuous improvement as well as permanent guarantee of a good level of welfare, apart from assessing regularly whether the four physical domains are providing for a good mental state on Domain 5, it is also necessary to record those findings so they can be monitored (analysed) and improved. In order to improve, risk factors need to be identified, corrective action will have to be put in place, and the performance needs to be reassessed. This model allows for a continuous guarantee of a good level of animal welfare as it also provides a framework for continuous improvement.



*Cycle of Animal welfare assessment - Journey to improvement*



## Appendix 1

### Domain 1: Nutrition/Hydration

In the Laying Hens Directive, there are a few provisions on the accessibility to feed troughs and drinkers, while in the General Farming Directive there is a more general provision on the feeding frequency.

**Article 4.1, Laying Hens Directive:** “All (alternative) 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; (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.”

**Article 4.3, Laying Hens Directive:** “In addition to the provisions laid down in points 1 and 2, (a) 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.”

**Article 6, Laying Hens Directive:** “Member States shall ensure that after 1 January 2002 all the cages referred to in this chapter comply at least with the following requirements: laying hens must have [...] 2. 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; 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.”

**Annex General Farming Directive:** “All animals must have access to feed at intervals appropriate to their physiological needs.”

### Domain 2: Physical Environment

Currently, provisions affecting the laying hens physical environment are listed in the Laying Hens Directive:

**Article 4.1.1:** All alternative systems “must be equipped in such a way that all laying hens have: (c) at least one nest for every seven hens must be provided. If group nests are used, there must be at least 1 m<sup>2</sup> of nest space for a maximum of 120 hens”.

**Article 4.1.1.3:** “(A) if systems of rearing are used where the laying hens can move freely between different levels, beside the requirement of Article 4.1.1 (c), “(i) there shall be no more than four levels.”

**Article 4.1.1.3:** “(B) If laying hens have access to open runs, beside the requirement of Art 4.1.1 (c) “(i) there must be several popholes 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;” and “(ii) 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; - equipped with shelter from inclement weather and predators and, if necessary, appropriate drinking troughs.”

**Article 4. 1:** “4. The stocking density (In alternative systems) must not exceed nine laying hens per m<sup>2</sup> usable area.”

**Article 6.1:** “1. laying hens (in enriched cages) must have: (a) at least 750 cm<sup>2</sup> of cage area per hen, 600 cm<sup>2</sup> 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 2,000 cm<sup>2</sup>; (b) a nest; (c) litter such that pecking and scratching are possible; (d) appropriate perches allowing at least 15 cm per hen.”

**Annex 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. 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 immunosuppression 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.”

## Domain 3: Health

The law currently in force sets down the following provisions:

**Annex, point 8 Laying Hens Directive:** “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.”

## Domain 4: Behavioural Interactions

Currently the Laying Hens Directive stipulates that:

**Article 4.1:** “1. All (alternative) systems must be equipped in such a way that all laying hens have: (d) 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”; “(e) at least 250 cm<sup>2</sup> of littered area per hen, the litter occupying at least one third of the ground surface.”

**Article 6.1:** “1. laying hens (in enriched cages) must have: (a) at least 750 cm<sup>2</sup> of cage area per hen, 600 cm<sup>2</sup> 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 2,000 cm<sup>2</sup>; (b) a nest; (c) litter such that pecking and scratching are possible; (d) appropriate perches allowing at least 15 cm per hen.”

## Domain 5: Mental Experiences

Given the nature of this domain, there are no specific legal provisions covering it. However, the lack of species-category and science-based provisions able to guarantee that the principles behind the four domains are met, is an indication of the poor mental experience hens experience on European farms.

# EUROGROUP FOR ANIMALS

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