



The assessment of plumage damage and emaciation at slaughterhouse in laying hens



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Definitions and welfare impact

Several animal-based indicators can be collected in slaughterhouses to monitor the level of welfare of laying hens on farm (EFSA, 2023). Among those cited in the EFSA report (2023) are plumage damage and emaciation which described very well the body condition of end of lay hens. The emaciation (extreme thinness, insufficient body condition) is an indicator of decrease of welfare due to prolonged hunger, disease or exhaustion. Emaciation is one of the reasons that will lead to carcasses condemnations at slaughterhouse. Emaciation can be assessed by estimating keel bone prominence (Welfare Quality, 2019). Whereas it is normal for lean types of birds, such as laying hens, to have some keel bone prominence and some visible breast muscles, emaciated birds have a very pronounced and prominent keel bone with almost no remaining muscle tissue.

The plumage damage is defined as the presence of areas with feather loss (denuded) and/or damage (EFSA, 2023). Plumage damage can be related to inadequate facilities (environment elements hurting or in contact with the bird) or from severe feather pecking from conspecifics. Severe feather pecking and its damages are a general welfare problem in laying hen flocks because the removal of feathers is painful and stressful for the animals (EURCAW-Poultry-SFA, 2022). It also increases the risk of poor thermoregulation, skin injuries and secondary infections, diseases, and eventually mortality. Severe feather pecking increase when birds are in living conditions where they have difficulty coping with the environmental stressors (related to feeding and lack of opportunities for foraging behaviour (Rodenburg et al., 2013)). Damages to the feathers on the back and rump usually indicate feather pecking and even if feather loss to the belly can be seen

in highly productive animals, it can also be caused by vent pecking (WelfareQuality®, 2019) (See Figure 1).

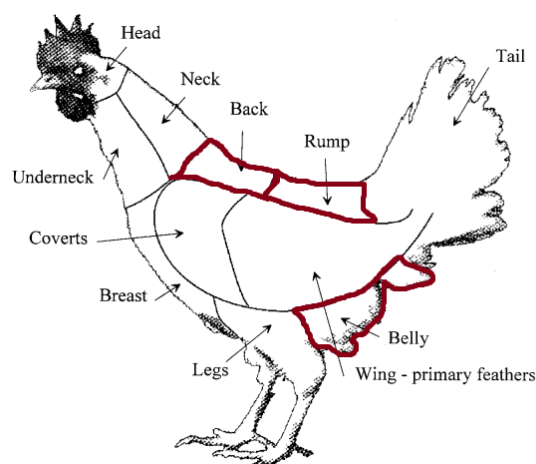


Figure 1: Body areas targeted in laying hens in case of severe feather pecking.

Source: Bilcik & Keeling, 1999



Legal requirements

Council directive 98/58/EC concerning the protection of animals kept for farming purpose:

"Members States shall ensure that the conditions under which animals (other than fish, reptiles or amphibians) are bred or kept, having regard to their species and to their degree of development, adaptation and domestication, and to their physiological and ethological needs in accordance with established experience and scientific knowledge [...]" (Article 4)

"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." (Annex, Point 14)

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Methods of assessment – Emaciation

While plumage damage can be assessed from a dorsal view of the birds, evaluating keel bone prominence requires a ventral view on the slaughter line.

The Welfare Quality Protocol (2019) includes the assessment of keel bone prominence. Nevertheless, it has not yet been validated in slaughterhouse conditions since for now it is mainly used in observations on living animals on-farm. Thus, this method of assessment still need to be tested and validated at slaughter. 100 laying hens should be randomly assessed on the slaughter line, in **ventral view**, before or after scalding, and scored as follow:

0 = normal (smooth to moderate breast muscle contour with keel)

1 = slightly to moderate prominent keel, but does not feel sharp, flat breast muscle

2 = severely prominent keel, depressed contour to breast muscle

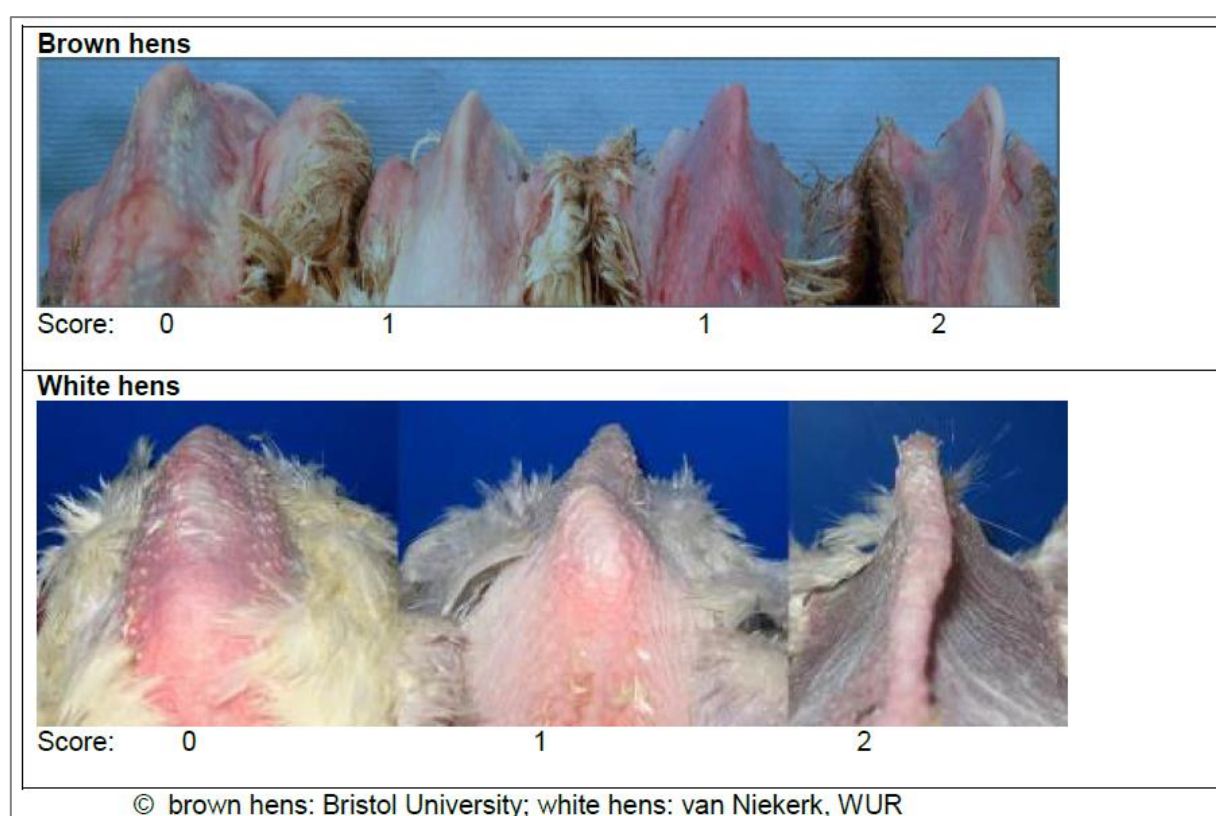


Figure 2: Notation scores of keel bone prominence in brown and white hens according to the Welfare Quality Protocol (2019)

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Methods of assessment – Plumage damage

Although well used during on farm assessment, plumage damage could also be observed post-mortem at slaughter, on the slaughter line **before scalding**, from a **dorsal view** of the birds (Figure 3). There is no protocol of assessment of plumage damage at slaughter, thus this method of assessment still need to be tested and validated. However, it can be carried out based on on-farm assessment protocols, such as the Assurewel Protocol (Main et al. 2012). In this protocol developed to assessed several indicators on farm including feather loss, the head/neck area and back/vent are separately scored. However, to adapt this notation scale to the slaughter line, the head, neck and back can be assessed together in one notation. The vent could also be scored if visible. The feather colour should be consider because of the difference in feathering (EFSA, 2023). This scoring scale could be used (Figure 4):

- 0:** No/minimal feather loss. No bare skin visible, no or slight wear, only single feathers missing
- 1:** Slight feather loss. Moderate wear, damaged feathers or 2 or more adjacent feathers missing up to bare skin < 5 cm maximum dimension.
- 2:** Moderate/severe feather loss. Bare skin visible \geq 5 cm maximum dimension.



Figure 3: Laying hens with feather loss scored 2 on the slaughter line before scalding in dorsal view (*photo ©Isabelle ROCHAS*)

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Methods of assessment – Plumage damage

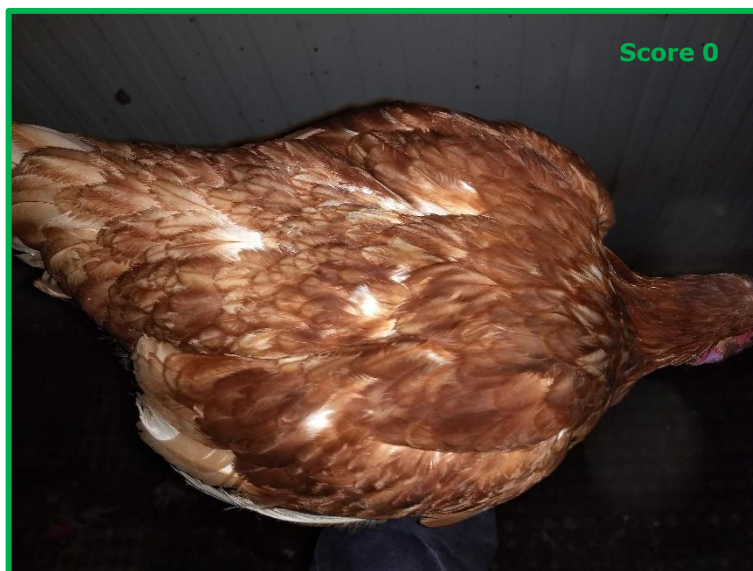


Figure 4: Scores of feather loss according to the Assurewel Protocol (Main et al. 2012) (©IRTA)

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