



# Poultry welfare in developing countries

## Welfare issues in commercial egg production

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This information note considers aspects of welfare that have been highlighted as concerns within commercial egg production (Perry, 2004; EFSA, 2005; LayWel, 2006). First some issues affecting chicks and growing pullets are mentioned, before discussing the most significant issues facing adult laying hens.

### CHICKS AND PULLETS

#### Disposal of male chicks

When chicks are hatched for egg production, only females are needed. Male layer strain chicks have no commercial value, which means that 50 percent of the chicks hatched have to be killed. Their disposal raises practical and ethical issues. Methods of disposal vary from region to region and country to country. In all cases, the aim should be to ensure that every male chick is killed humanely and instantaneously.

#### Chick handling

Whether chicks are to be reared for meat or egg production, it is important that they are handled with care in the hatchery. After being taken from the hatching trays by hand, chicks may either be sexed and sorted manually, or placed on a conveyor from which the males (often with different sex linked feathering rate or feather colour) are removed for slaughter. The female chicks are then placed in disposable chick boxes with perforated ventilation holes, for transport to the rearing houses.

#### Variation in chick or pullet sizes

The aim of the hatcheries and farms that supply pullets should be to produce birds of even body-weight and size. Variation in size can result in later problems of aggression, poor performance and injurious pecking.

### LAYING HENS

#### Osteoporosis

Osteoporosis in laying hens is a major welfare concern. It is the progressive loss of structural bone throughout the skeleton, which results in weakened bones. Weakened bones can lead to a high number of birds suffering keel, leg and wing fractures, which are likely to be painful. Osteoporosis can also cause birds to become paralysed, which can lead to death. Loss of structural bone in hens begins around sexual maturity and continues throughout the laying period. The process is accelerated in caged systems, which prevent birds from exercising. Fleming *et al.* (2006) found significant improvements in bone strength when birds were housed in aviaries, rather than battery cages. Nutrition also appears to affect bone strength, and the effects of osteoporosis can

be minimized by providing sufficient calcium, phosphorus and vitamin D in the diet. Another contributor to the severity of osteoporosis is genotype. Some genetic strains appear to be more susceptible to osteoporosis than others. It has been suggested that it is possible to select genetically against osteoporosis while still maintaining a high egg yield, but this has not been attempted on a commercial scale.

#### Keel fractures

One consequence of osteoporosis is that it greatly increases the susceptibility of bones to damage and fracture. In laying hens, the bone most likely to sustain a fracture is the keel bone, which can be damaged in two main ways: i) by misjudged landings when birds are perching or nesting in a furnished environment; or ii) when birds are handled during depopulation at the end of lay. The incidence of keel fractures caused by furnishings is higher in non-cage systems than in cage systems. In free-range and single-tier aviary systems (barns), the mean prevalence of bone breakages is 65 percent, 90 percent of which are keel bone breaks (Wilkins *et al.*, 2004). These findings are of particular importance in the EU, where conventional cages are being banned in 2012. However, the incidence of new breaks – those caused during depopulation – is higher in conventional cage systems than in other systems. This may be attributed to weaker bones in caged birds, due to lack of exercise. Access to the birds within the cage (i.e., the size of the aperture) and the manner in which the birds are withdrawn from the cage during depopulation are critical factors in determining bone breakages.

#### Behavioural restriction

In 1999, the EU introduced the Laying Hens Directive, stating that all hens must be housed in an enriched environment from 2012 onwards. This has involved the introduction of furnished cages, which will replace conventional caged systems. Furnished cages will provide birds with a nest, perches and pecking/scratching mats. A recent study comparing the physical and physiological condition of birds in four different housing systems for layers in the United Kingdom concluded that these aspects of bird welfare are better in furnished cages than in any other system (Sherwin, Richards and Nicol, 2010)

The importance of providing nests, perches and pecking areas stems from the natural behaviour of chickens. In the wild, poultry have the ability to build nests, scratch and peck, dust-bath and perch. These are all behaviours that have not been lost through genetic modification of poultry breeds and they are still important for good welfare of modern-day laying hen (Weeks and Nicol, 2006). In conventional cages, it is virtually impossible for hens to perform these behaviours. Hens also need at least 600 cm<sup>2</sup>

each to be able to stretch their wings and perform other comfort movements. Furnished cages do not allow birds total behavioural freedom, but they do allow birds to perform their most important behaviours to a degree not possible in conventional cages.

Non-cage systems permit even greater freedom of behaviour for the majority of birds in a flock. In large flocks of hens, however, some birds' access to facilities such as nests and perches is restricted by other birds, and aggression can be common. A small proportion of birds in non-cage systems can be excessively persecuted by their flock-mates. These so-called "pariah" birds have extremely poor welfare.

### INJURIOUS PECKING

Injurious pecking in laying hens is a major welfare concern that can spread through flocks, resulting in pain and high mortality. Injurious pecking can occur in all types of layer hen housing. In cage systems persecuted birds are unable to escape, but the problem tends to be confined to particular cages. In non-cage systems, once injurious pecking starts it can spread rapidly throughout the whole flock. Injurious pecking comprises feather pecking, vent pecking and cannibalism.

#### Feather pecking

Gentle feather pecking occurs when one hen pecks at the feathers of another, without pulling or removing the feathers. Severe feather pecking occurs when feathers are pulled violently or removed. The relationship between these two types of feather pecking is not clear, and they appear to have distinct risk factors. There may be a number of reasons for the onset of feather pecking, including deprivation of natural behaviours such as ground pecking (Rodenburg and Koene, 2004). The inability to perform behaviours can lead to long-term frustration, which may result in arousal, aggression or fear. Any of these emotional states may increase the likelihood that a hen will start feather pecking. There are clear genetic influences on feather pecking (Rodenburg *et al.*, 2008), and epidemiological studies have identified a range of important environmental risk factors. Bald patches on hens, where feathers have been removed, encourage further pecking of exposed body tissue. This has an economic impact on production, as birds lose energy and heat and therefore consume more food. Feather pecking is likely to be very painful for the affected hens, and may lead to cannibalism. The risks of feather pecking can be reduced by feeding mash rather than pelleted diets; providing additional foraging and fibre sources, such as chopped straw and vegetables; and ensuring good litter condition, to encourage birds to peck the litter rather than each other. Reducing light intensity is a short-term measure that does not address the cause of the problem.

### Cannibalism

Cannibalism occurs when the flesh or blood of another individual of the same species is consumed. It is a common problem in poultry, particularly laying hens (Newberry, 2004). Cannibalistic behaviour may be learned by hens, and the problem can spread rapidly throughout a flock. Cannibalism can arise as a result of severe feather or vent pecking, which often occurs due to frustration. Producers have attempted to reduce the incidence of feather pecking and cannibalism by beak trimming, which involves removal of up to two-thirds of the upper beak. This process is likely to cause pain, and does not combat the root of the problem. Some producers raise birds at low light intensities so they do not have the visibility to perform cannibalism. This has not been effective however, as the increased light levels needed to inspect birds are associated with cannibalism. Beak trimming has been banned in a number of countries, so an alternative is needed. Providing birds with enrichment, such as litter to peck at, may reduce frustration. It is also important to provide pullets with litter in their rearing environment. Cannibalism is also positively correlated with mineral, protein and energy deficiencies, so providing all nutritional requirements may reduce cannibalism. Selection of genetic strains that are not predisposed to cannibalism should also be encouraged.

#### Vent pecking

As with feather pecking, vent pecking can lead to cannibalism. Vent pecking is directed at the tissue around the cloaca (see photo).

This may be investigative behaviour to begin with, but once established can lead to birds pecking at internal organs or tissue. The result is often death. It is therefore advantageous to prevent birds from viewing the cloacal areas of other birds, by ensuring that nesting areas are not brightly lit and that there are sensible perch arrangements. It is also important not to bring the flock into lay too early – vent pecking can be triggered when small birds are encouraged to lay large eggs too early.

#### Emaciation

The metabolic demands of high egg production are great, and by the end of lay many hens show signs of emaciation, poor body condition and chronic stress. This can be minimized by ensuring that a good diet with adequate levels of nutrition is supplied towards the end of the laying period.

### AVOIDING WELFARE PROBLEMS IN HENS

Several sources provide advice on avoiding welfare problems in layers. These include national government codes of practice, such as the United Kingdom's Department for Environment, Food and



Varying severity of vent damage in laying hens

Rural Affairs (DEFRA) code ([www.defra.gov.uk](http://www.defra.gov.uk)) and assurance schemes guidance, such as the Royal Society for the Prevention of Cruelty to Animals (RSPCA) Freedom Food scheme, which details and specifies high standards of management and provision. ([www.rspca.org.uk/freedomfood](http://www.rspca.org.uk/freedomfood)).

The following are some important practical tips for avoiding welfare problems:

- Avoid conventional unfurnished cages, as these cannot provide good welfare for laying hens.
- If using a cage system, use furnished cages with at least 600 cm<sup>2</sup> of floor area per bird and a nest area. Manufacturers of furnished cage systems are listed in the LayWel project description of laying systems ([www.laywel.eu](http://www.laywel.eu)).
- Produce plans for preventing or coping with emergencies such as equipment breakdown or fire.
- Inspect flocks at least twice a day and check individual birds, even in cage systems where it can be difficult to observe individual birds at the back of a cage. At monthly intervals, catch samples of birds to look more closely for problems such as mite infestations or vent pecking.
- Keep good records of mortality and the causes of mortality. Record spontaneous mortality separately from culling figures.
- Seek veterinary advice if birds show signs of sickness. There are many links between poor welfare and poor health/disease. Improving one can often improve the other.
- If possible, obtain birds from rearing units close to the laying farm, as this will minimize stress during transfer. The new laying flock will settle more easily and early egg production is likely to be improved.
- Do not bring the flock into lay too early. Onset of lay at 17 or 18 weeks is associated with a greater risk of vent pecking than onset of lay at 19 weeks.
- Do not place perches at heights that permit one bird to peck another bird's vent.
- The use of mash rather than pelleted feed allows the hens to spend a longer time feeding, and reduces the risk of injurious pecking.
- The provision of good, dry litter to a depth of at least 10 cm is vital for the good management of hens in non-cage systems.
- For birds in non-cage systems, provide a raised slatted or wire mesh area separate from the litter area. Do not provide high perches, which are associated with "crash-landings" and subsequent bone fractures.
- In non-cage flocks, the risk of injurious pecking can be reduced by ensuring that the litter area is kept dry and friable. Add fresh litter regularly and, if possible, provide hens with additional pecking materials, such as straw or other dry vegetation.
- If the birds have access to an outdoor range area, encourage them to go outside as much as possible, by providing areas of shelter (from sun or rain) on the range. This reduces the risk of injurious pecking in the flock.
- Birds should have at least eight hours of light and at least six hours of dark in every 24-hour period, and light levels should not be less than 10 lux. In non-cage systems, consider providing brighter light over the litter areas, to encourage birds to forage and dust-bath, and lower light levels near the nest boxes and perches, to reduce the risk of vent pecking.

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