

Guide on best management practice for the welfare of pullets (meant for production of eggs for human consumption)

**Voluntary initiative group for the welfare of pullets
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The guide presents best management practice for the welfare of pullets (meant for production of eggs for human consumption). It is not meant to replace, contradict or put in question any existing legislation, charter, guide or guidelines.

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The rearing of pullets and applicable legislation

In the rearing period from one-day-old to laying maturity the birds intended for production of eggs for human consumption are called pullets. This guide shall apply to the pullets that later are meant to produce eggs for human consumption. When these birds have reached laying maturity and start laying eggs, they are defined as “laying hens”.

Minimum EU-standards for laying hens are set out in Council Directive 1999/74/EC laying down minimum standards for the protection of laying hens. The directive applies from the time, when the hens start laying eggs, and it outlines provisions applicable for enriched cage systems and alternative (non-cage) systems.

The pullets are typically moved to the laying systems at 16 to 20 weeks - around two to four weeks before they start laying eggs. During this period and during the whole rearing period from one-day-old and until the time they start laying eggs the provisions in Council Directive 98/58/EC concerning the protection of animals kept for farming purposes apply. These provisions are general, and do not in detail address the complex animal welfare challenges, which may arise during the rearing period. These challenges may cause poor welfare both during the rearing period and later in the egg-laying period. It therefore seems appropriate to draw up guides to best management practices to provide guidance for the implementation of Directive 98/58/EC and to improve welfare as regards pullets.

Why develop guides to best management practice?

The conditions in the rearing systems do not only affect the welfare of the pullets during rearing, they may also have a long-term effect impacting bird welfare during lay.

Examples of conditions during rearing, which are believed to have an important effect on the welfare of laying hens, are access to perches and litter from early life. EFSA (2004)¹ recommends that pullets should have access to elevated perches and raised platforms of suitable material and design from an early age, so that they are better able to use them when they are subsequently housed in non-cage systems. EFSA (2015)² writes that early experience in a three-dimensional space may facilitate the transition from rearing to the production environment as a result of perch usage and possibly as a result of bone strength.

The report accompanying the EFSA opinion from 2004 refers to studies, which demonstrated that in aviaries (multi-tier systems), under commercial conditions, early access to a litter substrate has a significant effect on feather pecking. Adult birds that never experienced litter performed significantly more feather pecking than birds in any other treatment group.

These examples clearly show that there is a link between rearing period and the subsequent laying period. It is therefore appropriate to give guidance on best management practices in the rearing period.

¹ Opinion of the Panel on animal Health and Welfare on a request from the Commission related to the welfare aspects of various systems of keeping laying hens from November 2004. EFSA Journal (2005) 197, 1 – 23.

² Scientific opinion on welfare aspects of the use of perches for laying hens. EFSA Journal 2015, 13(6), 4131

Recommendations

The recommendations, including the backgrounds, which are given below, focus on reducing the welfare problems, which are known to occur in some rearing systems, or which may occur in laying hen systems due to conditions during rearing.

1. Training of keeper and staff

The keeper having the daily responsibility for the pullets should have received appropriate training and be competent in the care and handling of pullets.

It is important that the keeper ensures that the staff, who have the daily responsibility for the pullets, have the necessary skills in good management procedures and in understanding the welfare, including the health and behavioural needs, of the pullets under their care. To this end appropriate training is important to acquire and maintain the necessary skills and to obtain understanding on how to comply with relevant legislation. It is important that staff are able to recognise normal behaviour and signs of good health, as well as abnormal behaviour and signs of illness and disease, and are able to quickly take effective corrective measures when necessary. It is good practice for the keeper to maintain records of staff training.

2. Inspection and stockmanship

2.1 Inspections

2.1.1 Frequency and contents of inspections

At least in the beginning of the rearing period, the birds should be inspected at least two times daily at different times of the day by the keeper or by other competent staff under the responsibility of the keeper.

Attention should be given to habituating the pullets to humans and to standard operating procedures, to minimize fear reactions. Habituation may for instance be achieved by conducting frequent flock inspections and by varying the routine, personnel, numbers of personnel and their clothing, as well as by increased inspection at the time when the chicks have been placed in the house. Such procedures have been shown to help reduce fearfulness in hens.

Flock inspection should at least include an assessment of body condition, any growth variation within the flock, respiration, condition of plumage, indications of head or vent pecking, and condition of droppings, eyes, skin, beak, legs, feet and claws. Attention should be paid to the presence of external parasites, feed and water consumption and to litter quality.

It is important to observe animal behaviour including distribution of the birds and their activity. Inspection should identify birds which are sick, injured or behaving abnormally, and include the functioning of automatic systems necessary for the health and welfare of the pullets. Any dead birds should be removed at inspection. Mortality found at every inspection shall be recorded and possible causes should be investigated.

2.1.2 In-house check – own control of pullet welfare indicators

It is recommended that the keeper of pullets conducts in-house checks /own control as part of the keeper's best management practices.

Collecting and documenting certain indicators for major animal welfare problems is in the own interest of the keeper as it provides the keeper with maximum information on the welfare of the flock and enables the keeper to detect deficiencies and take corrective actions. The following table contains recommendations for collecting major animal welfare indicators during the rearing of pullets.

Table 1. General recommendations for major animal welfare indicators in the rearing of pullets

Animal welfare indicator	Possible causes
Plumage condition: examination of the plumage condition, especially in week 4, 12 and 16 and at the time of transfer to the laying hen farm.	Feather-pecking, cannibalism; inappropriate feeding
Skin condition: examination of the skin for lesions, mainly around the back, the wings, the rump, the cloaca and the toes, especially in week 4, 12 and 16 and at the time of transfer to the laying hen farm.	Feather-pecking, cannibalism; overstocking
Nutritional status: examination of weight development and flock uniformity; ideally every week, but at least in week 4, 8, 12 and 16.	Inappropriate feeding; illness, number of vaccinations
Animal losses: high mortality (daily documentation)	Increased morbidity rate, disease
Use of veterinary medicinal products: Increased use of veterinary drugs (daily documentation)	Increased morbidity rate, disease
Water intake: Daily water consumption below or above normal.	Water shortage; dripping water troughs. Too warm climate in the house; unfavourable positioning of the drinkers
Fearfulness Excessive withdrawal from personnel	Lack of habituation to human contact

2.2 Housing

Housing should be designed and maintained to prevent injury or distress to the birds whenever it can be avoided.

It should be possible to clearly see and inspect all birds throughout the system. The design of the housing and equipment should facilitate this. In multi-tier systems, where birds are able to move freely between tiers, it should be possible to properly inspect all birds at all levels.

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

The design and dimensions of the cage door (where applicable) should be such that a pullet of around 20 weeks of age can be taken out without undergoing suffering or sustaining injury.

Housing should be suitably equipped and maintained to prevent pullets from escaping.

2.3 Cleaning

The surfaces of all contact materials and all equipment should be kept satisfactorily clean while the birds are kept. When a manual manure belt removal system is present, it should be run at frequent intervals and preferably at least once a week.

Droppings should be removed as often as necessary to ensure sufficient air quality.

Those parts of buildings, equipment or utensils which are in contact with the pullets should be thoroughly cleansed and disinfected every time depopulation is carried out.

High standards of biosecurity should be met and houses and equipment should be constructed so they are easy to clean and disinfect between batches.

Biosecurity is important as all potential threats (viral, bacterial and parasite infections) that the pullets may be exposed to may be transferred to the laying farm.

2.4 Brooding

After hatching, the chicks should be housed at the appropriate temperature.

For brooding, both whole-house heating and spot heating can be applied. In the case of spot heating, appropriate measures should be taken to avoid chicks from wandering too far from the heat source during the first week of life, for instance by using brooding rings that confine a group of chicks to a part of the house that includes a heater. Spot heating has the advantage that a temperature gradient is created, allowing chicks to choose a temperature zone in which they feel comfortable. Chick behaviour should be monitored carefully during the first week to avoid birds becoming either too warm (dispersal away from heat source, panting) or too cold (huddling close to heat source, emitting stress calls). When heating the rearing house, attention should be given to the fact that the floor, should be at the appropriate temperature before adding litter to avoid condensation, resulting in moist litter, and before placement of the chicks to avoid cold stress at placement.

When spot brooding is applied, it should be considered to use dark brooders. Dark brooders are heat sources that do not produce visible light (infrared elements, gas hoods, electrical heating) and that offer a dark and protective environment to the chicks, similar to a brooding mother hen. Dark brooders have been shown to have a strong suppressive effect on fear and on the development of feather pecking during rearing. Most likely this is because they serve to separate active from resting chicks. Often the feather pecking observed during rearing is performed by active chicks and directed at resting chicks. This preventive effect of dark brooders on feather pecking and fear has been demonstrated both in experimental studies and in commercial rearing conditions.

3. Choice of rearing system

During the rearing period the pullets should be kept in a system, which matches as far as possible the system, in which they will be kept as laying hens.

This minimises fear and distress when pullets are moved from the rearing system to the laying system, and also reduces problems such as feather pecking and injuries as well as emaciation and dehydration, which may be due to problems in navigating in the laying systems.

If pullets are reared in cage systems and transferred to alternative laying systems they will experience problems in navigating in a three-dimensional space. This may lead to injuries from colliding with equipment. If feeding and drinking equipment and nest boxes in the laying systems are located at different levels, and the birds are not accustomed to this, then there is an increased risk not only that the birds may suffer from emaciation and dehydration but also for problems with floor eggs. The same problems may arise if pullets are reared in floor systems and transferred to multi-tier systems in the laying period. When reared in a complex environment the pullets will develop better skills to navigate in a complex laying system. In addition, access to vertical space during rear, through building up bone strength, can help to reduce the risk of keel-bone damage during the laying period, which is high in all systems.

Pullets kept in alternative housing systems, especially floor rearing systems, during the rearing period and then transferred to cage systems in the laying period are likely to experience welfare problems such as feather pecking, fear and distress.

When comparing the pullet rearing system with the system in which the birds will be kept as laying hens, particular attention should be given to similar access to resources such as perches, ramps, food, and water and to whether the systems are single-tier or multi-tier systems.

There is good evidence that early ranging on arrival at the laying hen farm helps to reduce feather pecking. For pullets intended for egg production in free range or organic systems strong consideration should be given to providing pasture access from the age of 12 weeks. If pullets are transferred to laying systems with outdoor access, it is recommended that the pullets have access to a veranda (or winter garden) during rearing, to encourage the birds to use the ranging areas.

There should be close liaison between the pullet rearing site and the layer site to ensure that birds are reared in a way that reduces the stress at transition from the pullet rearing system to the egg production system. Also, management aspects should be taken into account such as lighting schedule and feeding times.

4. Feeding equipment and feeding

Feeding equipment should allow all pullets to eat with minimal competition.

The diet should be appropriate for the nutritional needs of the birds and their stage of production, and fed to them in sufficient quantity to maintain them in good health. When deciding on type of feed the effect on e.g. feather pecking in later life should be taken into consideration.

Pullets seem to be more affected by social facilitation than adult hens; therefore insufficient feeder space may result in frustration, aggression and uneven growth of the flock.

Feeding equipment should match the feeding equipment that the birds will have access to when they are later kept as laying hens. Liaison between the pullet rearer and laying hen producer regarding type of feeder and method of feeding (including feeding enrichment) to help match conditions during rear and lay can help to reduce stress after transfer.

There are indications that feeding pullets with pellets rather than crumbs or mash may lead to poor plumage quality and a higher incidence of feather pecking. This is ascribed to the longer time birds are spending feeding when fed crumbs or mash. It also seems that sudden diet changes during rearing can be associated with an increased incidence of feather pecking in the hens. Therefore, sudden diet changes should be avoided.

The provision of insoluble grit is considered very important to aid digestion in laying hens, and it can also be beneficial to pullets. Insoluble grit of an appropriate size and quantity should be provided from 3 weeks old.

Masking the changes between diets by mixing diets may help prevent disruption to the birds arising from diet change. Providing a well-balanced diet, including extra crude fibre, may help to reduce injurious pecking, plumage damage and mortality and might improve gut health.

5. Drinking equipment

Pullets should have sufficient daily access to clean water.

The height of the drinkers should be adjusted according to the height of the pullets.

Drinking equipment should match the drinking equipment that the birds will have access to when they are later kept as laying hens.

Problems may occur, when the pullets' drinking equipment is changed from open drinking water (e.g. cups) to nipple drinkers. The drinking equipment, which the pullets have access to during the rearing period, should therefore be similar to that, which they are expected to have during the laying period to minimise the stress involved for the birds at transition to the new environment.

Supplementary chick drinkers may in certain cases be provided for the first few days, to ensure that birds find water. However, it is important that this supplementary supply is removed once the chicks are using the permanent drinkers to ensure that they do not become reliant on the supplementary drinkers. Measures should be taken to ensure a good hygienic quality of drinking water.

6. Environment

6.1 Enrichment

Birds should be provided with appropriate enrichment to encourage activity and to exhibit their natural behaviours, including foraging.

The development of different behaviours typically takes place at an early age. Early experience with the use of different types of enrichment is therefore important. If pullets are deprived of enrichment, it may have long-lasting consequences. An example of this is feather pecking, which may be the result of lack of dust bathing and foraging material at an early age.

A variety of sufficient items, which are safe for the birds to use, should be appropriately placed throughout the house. The types of enrichment should target the behavioural needs of the birds, i.e. be biological relevant. Effective environmental enrichment will be used well by the birds, any items which are not well used by the birds, should be replaced by alternatives. There should be close liaison between the pullet rearing site and the layer site to ensure that matching enrichment items are provided in order to have a smooth transition on the access to enrichment at the laying farm.

Examples of environmental enrichment include:

- Provision of a sufficient amount of whole grain in the litter and or roughage supply (may reduce feather pecking later in life, as it increases foraging directed to the floor)
- Small bales of straw or alfalfa hay
- Hanging objects, pecking blocks and others
- Sand bath
- Chick paper

6.2 Litter

Pullets should, where possible, have access to friable litter of good quality, such as straw, wood shavings, sand or peat from the time, when they are introduced to the rearing house.

Pullets should have access to litter during rearing in order to increase foraging behaviour and to reduce feather pecking. As absence of litter may induce development of abnormal behaviour, litter should be available from day one. Litter should be of a suitable material and particle size, managed to maintain it in a dry, friable condition. Small particle materials, such as peat and sand, are best able to satisfy a pullets need to dust bathe. Litter should be of sufficient depth for dilution of faeces and should be dry and friable to stimulate foraging and dust bathing behaviour. For small chicks a too deep litter (>1-2 cm) layer should be avoided, as it will obstruct the chicks from scratching down to the flooring. This may lead to a moist or wet bedding.

In aviary rearing systems, where litter cannot be used before the system is opened, it is recommended to place chick paper and leave it during the rearing period.

It has been shown that the presence of chick paper on the floor of the aviary rearing system may prevent feather pecking, because feces, feed and dust which accumulates on the paper supplies the chicks with a foraging substrate.

The floor of houses should be solid (concrete or similar), as soil/earth floors may lead to moist coming up from the floor. Floor heating improves litter quality during winter climate with high humidity.

6.3 Perches

6.3.1 Access to perches

Pullets should at the latest after the first 7 days of life have access to raised perches. The design and placement of perches should be such that injuries to the birds are minimised and perch use is maximised.

Ideally, perch provision in rearing systems should match the perch provision at the layer site.

Pullets are highly motivated to use a perch, and if given access to perches, the pullets will start using them from a very early age – one week to 10 days old. The use of perches by laying hens, especially in alternative laying systems, seems to be impaired if the birds did not have access to perches appropriately designed and placed as pullets. Furthermore, there is evidence that birds with early experience of perch use have a higher accuracy in flights and jumps between different levels of multi-tier systems, and a lower prevalence of floor eggs and cloacal cannibalism. Also, provision of perches in the rearing period has been shown to reduce the risk for feather pecking in the laying period.

It is recommended that there are sufficient perches to allow all the pullets to perch.

Following the latest guidance on perch design and placement it is important to facilitate the movement of birds within the house. In particular, perches should be positioned to facilitate the movement of birds underneath and there should be enough vertical space above the perch to allow the birds to stand in a normal posture. As far as possible the perches should not be placed above litter area. However, in systems where the whole floor is covered with litter it cannot be avoided to place perches above litter.

The design of the perches should not cause any footpad or skin lesions or keel bone deformations.

6.3.2 Ramps and platforms

It is recommended that ramps and platforms are provided to assist bird movement in multi-tier systems

Research has demonstrated that hens provided with ramps and platforms have fewer fractures, including keel bone damage, falls and collisions and more controlled movements. Therefore, stepped perches, ramps or other solutions should be provided to allow easy access to high perches, platforms and grids.

6.4 Lighting

6.4.1 Light intensity

In light periods the light intensity should be a minimum of 10 lux and should only be reduced temporarily to 5 lux in the case of veterinary advice.

Periods of sufficient light are important to encourage normal behaviour and good eye health. Keeping birds under very low levels of light for a prolonged period of time risks abnormal development of the eye which can lead to both temporary and permanent blindness.

All buildings should have light levels sufficient to allow all pullets to see one another and to be seen clearly, to investigate their surroundings visually and to show normal levels of activity. Light should be distributed evenly within the accommodation and where there is natural light, light apertures should be arranged in a way to fulfil this requirement.

6.4.2 Light and dark periods

After the pullets reach ten to fifteen days of age there should be a minimum of 8 hours continuous darkness per day.

An uninterrupted period of darkness is important to allow the pullets a proper rest.

Light should be turned on and off gradually when changing from dark periods to light periods and reverse. A period of twilight of sufficient duration should be provided when the light is dimmed so that the pullets may settle down without disturbance or injury. Ideally, there should be a gradual reduction of light over about a 15-30 min. period, depending on the age and behaviour of the birds.

6.5 Noise

The sound level from the environment should be minimised.

Sudden noise should be avoided. Ventilation fans, feeding machinery or other equipment should be constructed, placed, operated and maintained in such a way that they cause the least possible noise.

7. Stocking density

At higher stocking densities the keeper should pay special attention to the amount and quality of the foraging material since this becomes even more needed for the birds to express their natural behaviour and prevent development of abnormal behaviour. It is also important to consider sufficient access to other resources such as to feed and water, perches etc.

It is important to have in mind that high stocking density can be a risk to the welfare of the animals.

The space allowance for birds should be calculated in relation to their demands on the whole environment (including air quality), their age, live weight, health and their needs to express certain behaviour. The stocking density shall be such that it does not lead to behavioural or other disorders or injuries³. Each bird should be able to express its natural behaviour such as:

- Feeding and drinking
- Wing flapping
- Dust bathing
- Foraging
- Perching
- Resting/sitting
- Preening

At higher stocking densities, the keeper should pay special attention to indicators of welfare problems, in particular feather pecking. The risk of feather pecking during rearing increases at higher stocking densities. Where problems are identified, appropriate action should be taken to rectify them.

8. Air quality and thermal environment

Pullet housing should maintain a thermally comfortable environment for the birds at all times, and ventilation systems should maintain good air quality e.g. by ensuring that aerial contaminants do not reach a level at which they are noticeably unpleasant. As a guideline:

³ See Council of Europe Recommendation of 28 November 1995 concerning Domestic Fowl (Gallus Gallus), art. 11, paragraph 3.

- 1) *the concentration of ammonia (NH₃) should not exceed 20 ppm measured at the level of the pullets' heads at any time*
- 2) *the concentration of carbon dioxide (CO₂) should not exceed 3000 ppm measured at the level of the pullets' heads at any time,*
- 3) *the inside temperature and humidity should be appropriate for the age of the birds, and*
- 4) *high concentrations of dust should be avoided*

High concentrations of ammonia and dust cause irritation of the eyes and respiratory system, and thus increase the susceptibility of the birds to respiratory diseases. There are furthermore indications that high concentrations of ammonia increase the risk of severe feather pecking. Elevated concentration of carbon dioxide (CO₂) is an indicator inappropriate ventilation of the house. In closed houses, mechanical ventilation is needed to maintain an acceptable air quality.

The temperature inside the accommodation should not adversely affect the health and welfare of the pullets. The relative air humidity should to be considered as it affects the birds' ability to cope with increased temperatures.

9. Beak trimming

The phasing out of beak trimming should be pursued. If beak trimming is carried out infrared trimming should be used.

Beak trimming, by which a part of the beak is removed, is painful. It should therefore be pursued to phase it out.

The beak is used by pullets and hens for many activities, such as eating, drinking, preening the plumage, removing ectoparasites and exploring the environment. These activities may be compromised by beak trimming.

Beak trimming is performed in order to reduce the occurrence and impact of injurious pecking, partly due to insufficient environmental conditions, such as stocking density, feed problems, insufficient air quality, insufficient litter, excessive light intensity or lack of environmental enrichment.

In the case of the first signs of feather pecking a number of corrective actions may be undertaken in order to rectify the situation, depending on the underlying causes. Adjusting the feed and dimming the light temporarily may be initial solutions until the underlying causes have been identified and corrected by appropriate measures. Addition of enrichment could also be considered as a corrective measure and even better as a prevented measure. Applying such measures successfully can render beak trimming superfluous.

Traditionally, beak trimming has been carried out either as infrared trimming or hot blade trimming. Infrared trimming is performed immediately after hatching, while hot blade trimming can be performed later. However, it is not allowed to beak trim chickens which are 10 days old or older. Both methods are painful, although hot blade trimming seems to be the most painful.

There is acute pain associated with the trimming itself, but also chronic pain associated with the formation of neuromas. This seems to be less evident in birds beak trimmed at a very early age.

If beak trimming is carried out infrared trimming should be used since it has less risk of giving abnormalities.

Glossary

Alternative system: Any non-cage system used for rearing pullets or laying hens

Beak trimming: Removal of the tip of the upper beak or the tip of both the upper and lower beak.

Chick paper: Paper on which young chicks are kept, for instance placed on the floor of aviary systems

Dark brooders: Heat sources that do not produce visible light and that offer a dark and protective environment to the chicks, similar to a brooding mother hen.

Enrichment: Items or housing designs which stimulate the animals to perform various activities such as pecking, perching, walking etc.

Foraging material: Material, such as for instance grain or roughage, which can be used by the birds to express foraging behaviour

Litter: any friable material enabling the hens to satisfy their ethological needs

Pullet: birds intended for production of eggs for human consumption from they are one-day-old and until laying maturity