

GUIDELINES END of LAY HENNOVATION



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WHAT IS END OF LAY?

At the end of the laying period the hens are either removed from the building to be slaughtered for human consumption or are killed within the building and sent for destruction.

End of lay (EoL) addresses this last transport of the hens to the slaughterhouse, from the moment of catching until the moment of slaughter and also includes preparation and planning for this event.








EoL birds are transported from the farm to slaughterhouse which entails catching the birds at the farm, loading them into the truck, transport and finally unloading them once at the slaughterhouse to be dispatched. During all these steps, if no preventive measures are taken, spent hens can suffer from hunger, thermal stress, pain and anxiety. Thus measures should be taken to reduce stress at all points of the process in order to maintain satisfactory levels of welfare.



EU laying hen numbers were about 6,400 million in 2012.

EoL hens are generally purchased 'off farm'. Their economic value has increased slightly as markets, especially in Africa, develop. This has improved the care taken in handling and the investment in transport systems in some countries. Many types of vehicle are used, but dedicated trucks with side curtains are increasingly common.

Gradually the modular systems such as Anglia Autoflow and gas stunning are replacing loose crate handling and waterbath stunning.

| Where | What | | Details |
|-----------------|----------------|---|--|
| On farm | Preparation |  | Food withdrawal Supplements |
| | Catching |  | Catching crew Catching method |
| | Loading |  | Crate/Module type Stocking density Loading truck |
| On the road | Transport |  | Climate Duration feed/water Climate control |
| | Resting period |  | |
| Slaughter house | Lairage |  | Climate control |
| | Handling birds |  | Unloading truck Removed from crates/modules |

Times where birds can suffer during the EoL period.



EoL

Planning and
optimising time

It is essential to plan the whole process and anticipate having important information on the flock such as the number of birds, the age, the breed, the approximate weight, feather condition and health status. Any farm access difficulties should be noted in advance.

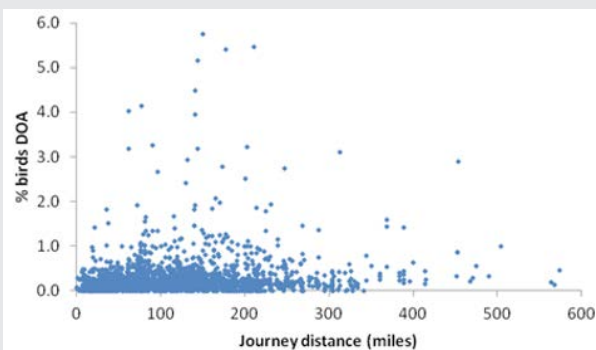
The greater the duration of exposure to stressors, the greater stress for the bird thus loading, transport and lairage times should be minimised, whilst still handling birds with care.



Case study - A planning meeting for each flock helps hen welfare

When a new manager came to a hen slaughter plant he had a look through the records to see what was currently being achieved. One figure jumped out at him: the average DOA (Dead On Arrival) figure of 0.9%. This was not good. Too many hens were dying between the farm and the slaughter line. Bad for hen welfare. Bad for income, as the dead birds were not fit for sale for human consumption.

So, he asked his transport manager, farms manager and plant manager to ask their teams, including the lorry drivers where they thought things were going wrong. They reported back with many ideas. One of these was the variability between flocks and how far they had to travel. Some had to make long journeys of over 500 km as there are few hen processors in most countries.



Variation in DOA (Dead On Arrival) for UK flocks during transport in 2009.

The new manager decided to take action in several areas but a main one was to **plan ahead** so that each flock would be treated as well as it possibly could be.

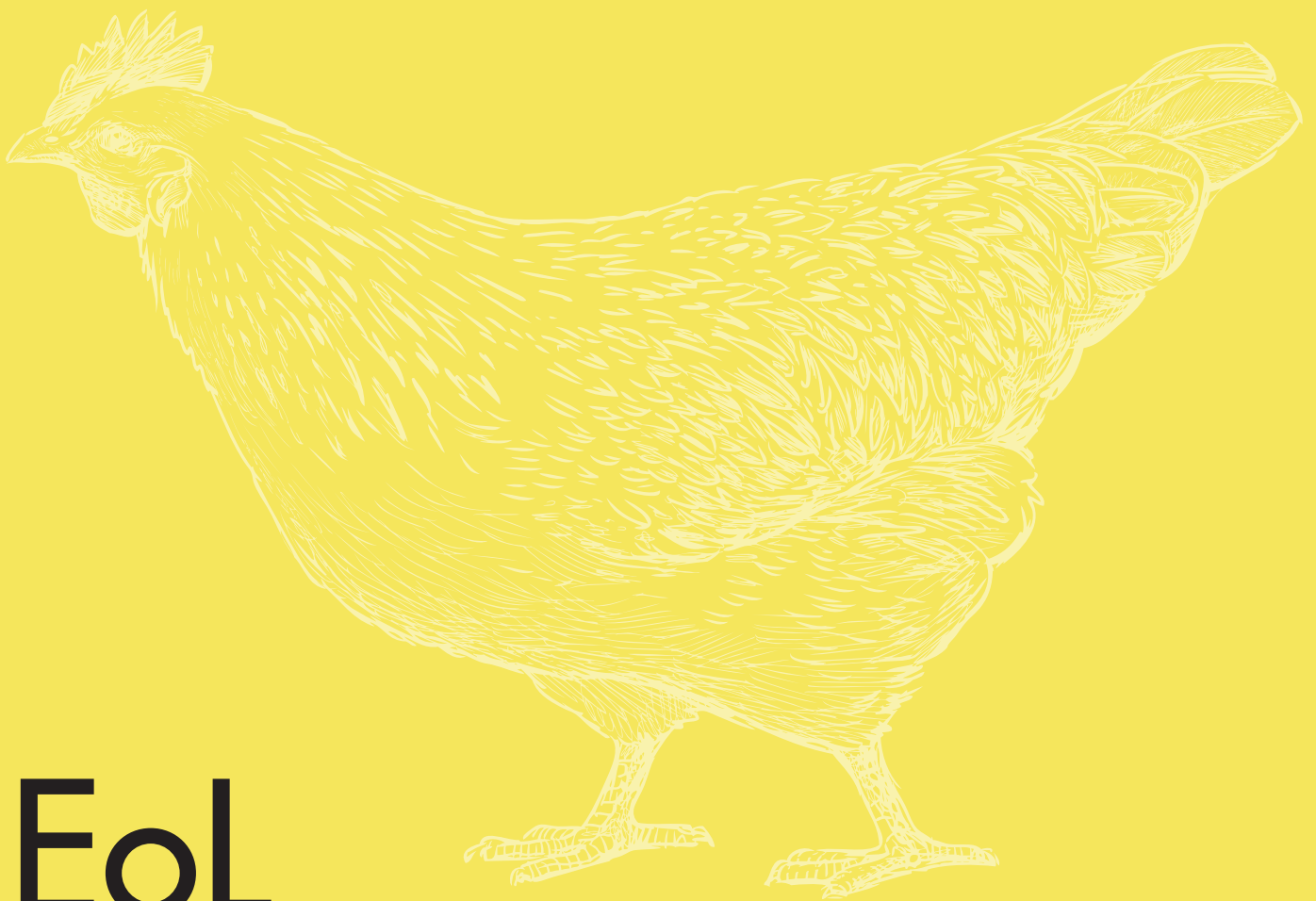
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1. Every farmer was asked to weigh about 50 hens at random and to look at the flock as a whole and score their feather cover. They had to add these 2 extra pieces of information to the FCI form (or recording form), which is a legal document recording things like use of medication and diseases.
2. He set up a **daily planning meeting** where a small team looked through the recording forms of flocks due in for slaughter next day. They took into account the housing system, the health of the flock, the weight of the flock, the age of the birds and their feather cover. This gave them a good idea of how robust the hens would be or whether they needed extra careful handling and transport. They worked out how far the birds would travel and looked at the weather forecast.
3. Then they decided how many birds to load per container and let the catching team leader and drivers know what sort of flock to expect and how to look after them.

SUCCESS!

Along with the other measures this regular planning meeting and letting everybody involved with handling the birds know what to expect dramatically reduced bird losses. In the first year the average DOAs were down to just under 0.5% with year on year improvements. Five years on the average DOA was 0.13% with many loads achieving no losses at all.



EoL

How to improve
welfare on farm?

Before transportation, laying hens need some preparation to make transport safe and efficient.

There are a lot of factors causing stress to End of Lay (EoL) hens on farm related to preparation before transport to the slaughterhouse.

MAIN WELFARE ISSUES TO TACKLE ON FARM

- Withdrawal from food
- Injuries to birds due to catching
- Injuries to birds due to loading
- Identify and cull unfit birds

MANAGE FOOD DEPRIVATION

Usually the morning before depopulation the food is withdrawn from the birds to make sure they will have their intestines empty. This results in a minimum of defecation during transport and thus a minimum of soiling of the birds, in the crates as well as on the slaughter line, which is important for hygienic reasons.

In general, it is advised to start fasting laying hens in the morning of the day of depopulation but feed withdrawal before slaughter should not exceed 12 hours including transportation and lairage. Adult birds must not be deprived of feed and water for more than 12 hours (Regulation (EC) No 1/2005).



If there is not a good planning of the loading time, transport duration and lairage the duration of food deprivation can easily exceed 12 hours.

Timing of food deprivation should be well established and agreed by the several actors (farmers, transport and slaughterhouses) in order to optimise fasting according to logistics.

Preparation for transport should be in coordination with transporter and the slaughterhouse.



Water must always be provided until the point of catching.



Case study - Reduce the effects of stress due to feed withdrawal

Feed withdrawal is common practise to reduce the amount of food in the gastrointestinal tract, therefore decreasing the likelihood of carcass contamination. Laying hen farmers may also receive a fine from the processor when hens have too much gut fill.

However, hungry hens tend to pick up anything, mostly litter and faeces, and have less energy to combat transport stress which may lead to damage of the hen.

A network consisting of an EoL hen processor, two poultry feed manufacturers, a hen rearer farmer and a poultry veterinarian, came up with the idea that adding a heat-stress reducing product to the drinking water a day before unloading may reduce hunger feelings, stress, carcass damage and contamination.

Stress response in EoL hens may alter the electrolyte balance and blood pH, like heat-stress does, and therefore may be combated using a heat-stress reducing product. The product will be added to the drinking water and contains the minerals **sodium bicarbonate, potassium chloride, magnesium acetate and vitamin C.**

Sodium bicarbonate, potassium chloride, magnesium acetate and vitamin C:

Stress increased ventilation produces a disturbance in the blood acid-base balance termed respiratory alkalosis. Blood bicarbonate is known to decrease in response to heat stress and sodium bicarbonate has been used successfully to alleviate pulmonary hypertension. Heat stress is known to depress plasma potassium concentration in chickens and lowers antioxidant component vitamin C in tissues of broilers. Furthermore, stress may decrease plasma levels of sodium and magnesium.

HANDLING AND CATCHING

Catching may cause broken and dislocated legs, especially if birds are carried by one leg.



As EoL hens, they have been mobilising calcium during lay debilitating their bones and the catching can easily cause bone fractures, dislocations, bruises and wounds all of which cause pain to the birds.

Levels of damaged birds are often greater for hens depopulated from furnished cages, than from aviary and free-range systems. The depth of cages make catching of the birds at depopulation harder and birds are generally carried out to the transport container risking bruising from collisions along the way.

ENSURE A PROPER CATCHING METHOD



Birds should be caught by grasping the legs around the lower shanks (just above the feet). They should be caught by **both legs** to avoid injury and suffering.

Hens must **never** be lifted or carried by the head, neck, wing or tail.



Catching in cage systems

- Catching teams should work together on either side of the cage bank.
- Caged hens should be caught by grasping the legs around the lower shanks (just above the feet). They should be caught by **both legs** to avoid causing the bird injury or suffering.
- Birds must be removed from the cage **individually**.
- The **bird's breast should be supported during removal** from the cage, or a breast support slide used.
- Once removed, the bird may be placed directly into the transport container or handed to a second person to transfer it to the container.
- If any bird starts flapping during capture, gently rest its breast against the side of your leg for a few seconds. This helps to calm the bird and reduce wing flapping.

Stress is much higher when birds are removed from their cages three at a time and carried in an inverted position from the house than when they are removed individually and crated before getting out the house.



Catching in loose housing systems

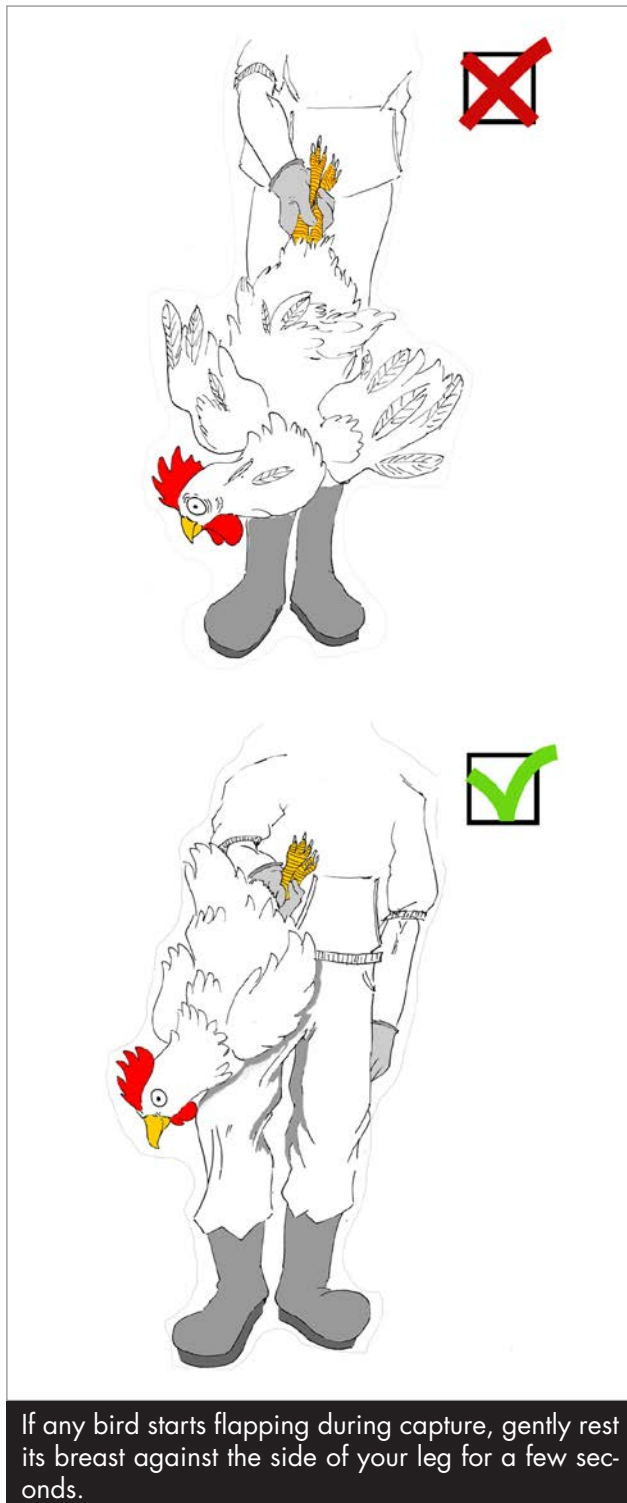
- Usually this is done in dimmed light, so hens don't fly away. The resting birds can easily be taken from the perches.
- Birds should be caught by grasping the legs around the lower shanks (just above the feet). They should be caught by **both legs** to avoid injury or suffering.
- Once caught, the bird should be lifted gently, with its head hanging downward, and transferred to the transport container.
- If any bird starts flapping during capture, **gently rest its breast against the side of your leg for a few seconds**. This helps to calm the bird and reduce wing flapping.
- When birds are carried in groups, care should be taken to ensure that they can be held comfortably and without causing the bird distress or injury. As a guide, **no more than three birds should be carried in one hand**.
- Birds should be lowered gently into the transport containers, onto their breasts and allowed to regain their balance before further birds are added to the tray.



Bird removed from a cage: singly, caught by both legs and with the breast supported.

Instead of chasing, birds that are moving away are collected at a later stage, when they have sat down elsewhere. This makes reducing at the same time the health and safety risks for staff and the stress of the flock.

More information on catching and handling of birds is available at www.hsa.org.uk/catching-and-handling/catching-and-handling



TRAINING AND EXPERIENCE OF THE STAFF IS ESSENTIAL

A special crew catches the birds to take them out of their housing system.

Training and experience of the catching staff enables them to work collaboratively and calmly with groups in each aisle, in line from one end of the house to the other. This causes a minimum disturbance of the birds, reducing the number of birds that start running around.



Training stockpeople and handlers from changing attitudes and in handling and transport have benefits for animal welfare. Incentive programmes are also effective in reducing damage to birds. For example, providing incentive pay to employees has been proven to reduce broken wings during catching of broilers.

CARRYING AND LOADING THE BIRDS

Birds should only be carried by the legs and care taken to avoid hitting solid objects particularly if wings are flapping. No more than 3 hens should be carried in one hand.

Pushing through narrow openings of crates often causes broken wings. The hens should be lowered gently into the crates onto their breasts and allowed to regain their balance before further birds are added to the tray.

Systems with wide openings will also result in fewer broken bones.



If the henhouse is suitable, the crates may be brought in on carts, reducing the distance catchers have to walk with the handled birds.



Cart to facilitate bringing crates into the henhouse.

Crates or modules are brought out of the henhouse and loaded onto the truck. Once all the birds are loaded into the truck, it will leave to the slaughterhouse.

PASSAGEWAYS AND DOORWAYS

The efficiency of catching and crating birds is also influenced by the condition of the passageways and doorways in housing systems.



All passageways and doorways should be cleared to allow free movement of the personnel.

Wide passageways with clean concrete floors allow the use of carts or small motorized equipment to bring transportation crates into the house, thus reducing the distance birds need to be carried.

Clean ways during handling and loading are important to facilitate moving birds and reducing the time spent manipulating birds, therefore reducing stress. For example, removing litter from the passageways hours before the handling starts will enable the use of carts in the house or smoothen the path catchers need to walk, leading to less damaged birds.

BIRDS SHOULD BE FIT FOR TRANSPORT



European legislation dictates that birds that are not fit for travel should only be transported if this would not cause an increase in suffering. As this cannot be realised for sick and injured birds, they should therefore be humanely killed prior to transport.

The catching crew should be instructed how to deal with unfit birds for transport (such as runts, emaciated, sick, injured and birds unable to walk), but ideally these should be identified and dispatched by the farmer beforehand.

In good health condition, birds will be more capable to endure the stress of transport and arrive at the slaughterhouse in good condition. To increase the chance for survival additional measures can be taken.



Vitamin C provision through the drinking water prior to transport can increase the ability to cope with stressors and may increase survival rate at the arrival to the slaughterhouse.



EoL

How to improve
welfare during
transport?

Transportation is an extremely stressful process for commercial poultry. From a relatively calm and stable environment, the birds are suddenly taken to an unknown situation, with various stressful stimuli such as noise, vibrations, deprivation of food and water, extreme temperatures and high stocking densities.

The greater the duration of exposure to stressors, the greater the integrated stress for the bird.

Strategies intended to safeguard animal welfare are strongly recommended, also for the benefit of production and efficiency as the number of losses can be reduced dramatically.

MAIN WELFARE ISSUES DURING TRANSPORT

During transport, hens can suffer from:

- Thermal stress
- High stocking densities
- Dehydration
- Noise and vibration of the environment
- Injuries

PREVENT THERMAL STRESS

The degree of thermal stress (i.e. when the birds feel too hot or cold) experienced by birds in transit depends on the duration and intensity of both heat and cold stressors. Hot summers or cold winters are associated with higher losses. Rain and wind can also cause an increase of DOA (Dead On Arrival).



Thermal stress is thought to be the major stressor during transport and contributes to both deaths and overall transit stress in poultry.

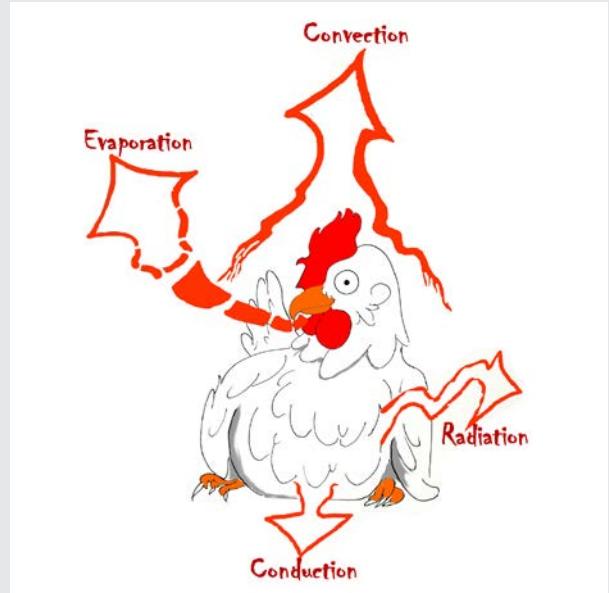


How do hens regulate body temperature during transport?

In order to regulate body temperature, birds lose heat through:

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- Convection: heat loss by airflow created by fans and wind
- Conduction: heat loss by contact with a cooler surface
- Radiation: heat loss through heat given off by the hen
- Evaporation: heat loss by panting



Under hot conditions, convection, conduction and radiation are reduced because of the lack of temperature difference between the bird and the environment. The effectiveness of panting decreased in hot and humid conditions. **Panting, agitation** and **restlessness** are indicators of heat stress.

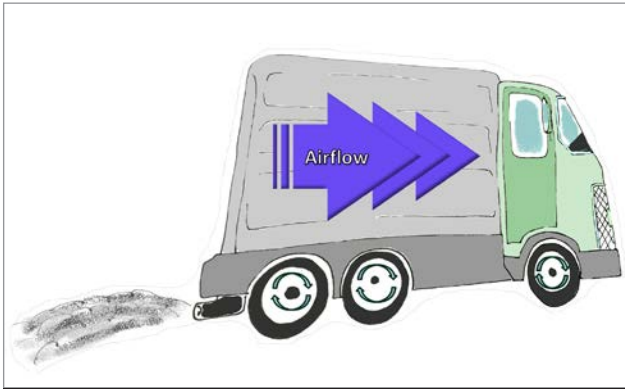
In cold conditions, hens keep themselves warm by huddling together. **Shivering, huddling** and **lethargy** are indicators of cold stress.



Airflow through a vehicle with no fans moves in the same direction as the vehicle. Therefore, temperatures can vary widely within the vehicle and are usually high at the front and top of a vehicle and low at the bottom and rear.



High stocking densities in hot weather means birds gain conductive heat from close contact with each other and the air cannot flow around their bodies to allow convective loss. Sunshine increases heat load.



Airflow through a vehicle with natural ventilation moves in the same direction as the vehicle.



Temperatures inside the truck when closed can vary as well. When the trailer is closed up and tarped, both hypothermia and hyperthermia occurred within the same trailer.

Temperature limits during transport are advised to not be higher than 24 – 25°C in the containers, and a maximum relative humidity of 70%.

However, the effect of climate on the birds also vary according to their physical state. For instance, poorly feathered EoL birds at 22–28° C are likely to be thermally comfortable at the usual high stocking densities.



Temperature control on trucks is essential to maintain temperatures at an acceptable level. Temperature recording should be done on all trucks on various locations on the truck in close vicinity to the birds. Temperatures should be both recorded and linked to an in-cab monitoring and alarm system.

In order to maintain a homogenous environment within the lorry, ventilation should depend on stocking density and location in the truck.

Tips to limit heat stress:

- In hot weather, the truck should travel during the coolest part of the day.
- The stocking density should be reduced.
- The ventilation inside the vehicle should be optimised. In natural ventilated vehicles, minimise the time of stops and keep the vehicle moving as much as possible until the birds can be unloaded.

Tips to limit cold stress:

- Side curtains are effective to protect the birds and these are very important in cold, wet and windy weather even during loading of EoL hens especially those that are lightweight and poorly feathered.
- In winter and in cold regions, it is especially important to minimise wind chill by the use of curtains and parking in the lea of buildings or trees and to avoid birds becoming wet.



During winter time indicated that over a 4 hour period birds experienced a variation in temperature during transport of 20-25 degrees C.



Adjustments of stocking density according to outside air temperature during transport to prevent cold stress

Records of transport-related mortality for EoL hens revealed an increase in mortality for journeys when average outside temperature was colder than -2 °C.

When planning transport of hens the transporter should take into account the expected outside temperature during transport and adjust the loading density accordingly. For transports carried out in very cold weather, an increase (typically by 8-15%) in the stocking density is recommended particularly in conditions where the birds are poorly feathered, low weight, the weather is wet or windy and/or the journey is long. Levels of mortality should be monitored to suggest adjustments to subsequent loads.

PROVIDE A CORRECT DENSITY INTO THE CRATES

The number of birds per crate influences the microclimate around the birds.



Higher stocking densities may be used in winter, but precautions should be taken for those birds during the time in lairage as temperatures may get too high.

There is a strong argument for using different stocking rates in different areas of the load (in particular for reduced numbers in drawers at the top-front of the load). It is based on the fact that ventilation varies according to the location within the load.

The stocking densities recommended by European legislation can be used as a guide that needs adjusting according to weather, bird condition and journey duration.

Guideline of space allowances for poultry in transit (EU, 2005).

| Weight of poultry (kg) | Space allowance (cm ² /kg) |
|------------------------|---------------------------------------|
| Chicks (day old) | 21-25 cm ² /chick |
| <1.6 | 180 – 200 |
| 1.6 – 3.0 | 160 |
| 3.0 – 5.0 | 115 |
| > 5.0 | 105 |



Stocking density in the crates plays an important role and should be adjusted according to body weight of the birds and climatological circumstances.

TAKE INTO CONSIDERATION THE DURATION OF THE JOURNEY

Typical times in transit of end-of-lay hens can vary considerably: journeys can range from 5.4 to 17.6h have been reported in the UK.

DOA (birds dead on arrival) can vary from 0.7% (under 12 h of transport duration) to 9.9% (over 24 h of transport duration).



In most European countries, only a few slaughter plants accept EoL hens, so many face long journeys.

In long journeys, there is a strong recommendation for an accurate monitoring of temperatures and the use of correction measures if threshold temperatures (either hot or cold) are achieved that could thwart animal welfare.

ACCESS TO WATER AND FOOD

In general, no food or water is supplied to EoL hens during the journey. However, for long journeys water supply is obligatory on the trucks and for even longer distances also food should be supplied.



Depending on the distance, the transport will have a longer or shorter duration and may require a resting period and provision of water and/or food.

Water supply systems have been developed for application on trucks. Mostly, these comprise a water tank connected with tubes to fixed water systems in container units.



For providing water to birds in crates, different systems are used. These consist of loose tube systems that are attached to the crates. Side branches with nipple drinkers are stuck into the crates. The system is placed after the crates are loaded on the truck and is connected to a water tank on the truck.



A system for providing water in transit.



Solid food is never supplied to birds on transit. Apart from the issue of soiling with manure, experts indicate that birds on transport easily vomit and can choke on the food. Instead liquid nutrients are added to the drinking water.

MINIMIZE VIBRATIONS ON THE TRUCK

Birds find vibration below 5 Hz particularly aversive. Transport normally generates resonant frequencies of 1-5 Hz which are associated with some degree of discomfort.

Vibration should be reduced, for example by using air suspension.

GOOD CRATES ARE IMPORTANT TO MINIMISE INJURIES

Damage to birds may occur at various stages of the transport. If crates are not closed properly, birds may get trapped, which may cause bruises, wounds or even death. Crates with damaged openings may lead to birds getting out too early, with the risk that they get stuck in the conveyor belt at the slaughter plant.

Old crates and their lids are important causes of broken bones at arrival. Broken plastic crates can cause different type of injuries and they should be replaced as soon as the damage is noticed but in some cases the damage is not clearly visible when it comes to lids.

The sliding door, even if not visibly damaged, can be tougher to move when they get older and workers usually use more strength to move them. This can lead to very sudden, fast and not fully controlled movement of the door and a part of the hens' body can be unintentionally stuck or injured.

New well-designed lids can decrease the number of damaged birds during transport and unloading.



For transport of poultry a number of European Directives and Regulations need to be taken into account:

Transport regulation (EC, 1/2005): This regulation gives directions for all aspects regarding transport of animals and also provides definitions of transport and journey.

Killing of animals (EC, 1099/2009): Although this regulation does not specifically address transport, but mainly focusses on the killing of animals, it does contain some rules with regards to the period from arriving at the slaughter house until the moment of slaughter.

Specific hygiene rules for food of animal origin (EC, 853/2004): This regulation contains several rules regarding animal welfare; also the HACCP procedure welfare at arrival at the slaughterhouse is influencing transport of poultry.



EoL

How to improve
welfare at the
slaughter-house?

The slaughterhouse is the end point of the End of Lay (EoL) period.

When birds arrive at the slaughter plant, they may not be slaughtered immediately, but may wait several hours in the lairage area.

Birds are then unloaded, shackled and stunned. All these steps can have several major welfare concerns.

IMPROVING WELFARE DURING LAIRAGE AND UNLOADING

Once at the slaughterhouse, the truck can either park in the lairage waiting or the crates are unloaded in the waiting area until the moment of slaughter and then individually manipulated for the slaughter.

Monitoring the condition of birds and their environment in lairage is very important.

MINIMISE WAITING TIME AT LAIRAGE

Unlike mammals such as pigs, hens do not benefit from a rest period in lairage.



Where possible hens should be unloaded on arrival and slaughtered with minimum delay to minimise dehydration and stress.

PREVENT HEAT STRESS AND COLD IN LAIRAGE

Hens frequently experienced conditions of substantial heat and cold stress during lairage and unloading.

It is important to provide a roof to shelter hens in lairage from the weather and in hot weather fans should be directed onto the birds if they are observed to be panting.



Birds observed to be panting will become progressively dehydrated and increasingly heat stressed. Depending on the duration of the journey and the duration of their stay in the lairage area, birds need to be supplied with water and/or food.

Some plant has water supply for birds in the lairage. This is realized by sliding tubes with nipple drinkers between the crates.



Temperature regulation during lairage

As natural ventilation stops when the truck is parked but the density is still high, **heat stress** can be a problem in birds that are waiting in the truck. Birds should have access to ventilation (either natural or artificial) that help to decrease temperature inside the flock and reduce the risk for heat stress. There should also be sufficient space around each module or stack of crates for effective airflow.

In low temperature regions, birds can **suffer from cold**, which can be prevented by supplying appropriate cover and even artificial source of heat. A controlled environment providing adequate ventilation while avoiding excessive wind and air movement (except in hot weather) onto the birds is highly desirable.



Drinking water into crates at lairage.



Despite the use of a covered lairage and ventilation, temperatures clearly go up substantially during lairage.

The duration of such times needs to be kept to a minimum of preferably less than 1 hour.

IMPROVING WELFARE DURING SHACKLING AND STUNNING

Following arrival at the processing plant, most EoL hens are manually removed from the crates/modules.

Where electrical stunning is used, live birds are suspended by their legs from shackles for conveyance to the bath. Many birds react to this potentially painful procedure by struggling, flapping their wings and attempting to attempt to regain upright posture themselves. This can lead to injury and reduces the chance that the bird will be effectively stunned prior to slaughter.



The use of a **breast support conveyor** can be useful to reduce the stress of hanging birds and the struggling in shackles. Observations in U.S. slaughter plants showed that providing a breast rub made from strips of smooth conveyor belting can also reduce struggling and flapping. These systems should be used by slaughterhouses with problems of stress during handling and lesions before stunning.



Controlled atmosphere (GAS) stunning of chickens is now the commercial norm in some countries, with welfare and meat quality benefits such as reduced breast muscle haemorrhaging and bone breakages. In gas stunning, birds are exposed to controlled atmospheres that renders them unconscious in few seconds.

The benefit for animal welfare is that animals can avoid human handling before the loss of consciousness as the animals can be exposed to the controlled atmosphere while still into the crates.

Once all animals are insensible, automation of shackling is much easier with gas-stunned birds than conscious ones that may flap, struggle and experience pain when shackled. Besides, gas stunning will also benefit meat and carcass quality. For instance, the severe wing flapping often results in broken bones and haemorrhages leading to condemnations of the carcass.



Gas stunning of birds reduces breast muscle haemorrhaging and bone breakages minimising handling of the animals before loss of consciousness. Gas stunning benefits also meat and carcass quality.

ON FARM KILLING OF HENS

At the end of the laying period the hens are removed from the building, either to be slaughtered for human consumption or they may be killed within the building and sent for destruction

On farm killing of hens at EoL: pros and cons of different methods

| Killing method | Advantages | Disadvantages |
|--|---|--|
| Electrical stunning followed by neck dislocation or bleeding | Immediate unconsciousness and insensible to pain. | <ul style="list-style-type: none"> • If electrical stunning is not performed correctly, bleeding may be painful. • Potentially dangerous equipment (H & S risk). • Needs sophisticated equipment and a power supply. • Is a stunning method therefore must be followed by a killing method. |
| Percussive stunning followed by neck dislocation or bleeding | Immediate unconsciousness and insensible to pain. Accessible equipment | <ul style="list-style-type: none"> • Small risk to the operator. • Although birds are killed by this method the legislation classed in legislation as a 'stunning method' therefore must be followed by a killing method. |
| Killing by exposure to gas mixtures (only certain permitted gases) | No (or low) handling required | <ul style="list-style-type: none"> • Loss of consciousness not immediate. • Needs sophisticated equipment. • Requires licensing by the competent authority. |
| Neck dislocation | Easy to perform | <ul style="list-style-type: none"> • Does not result in immediate loss of consciousness. • Requires training of the operator. • Requires handling and manipulation of the animal which is stressful. • Very erratic if not performed appropriately. • Shall not be used as a routine method but only where there are no other methods available for stunning. No person shall kill by manual cervical dislocation more than seventy animals per day. Manual cervical dislocation shall not be used on animals of more than three kg live weight (EC 1099/2009). |

Note: Decapitation is not legal without pre-stunning (EC 1099/2009).



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