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The Life of: *Laying hens*

The laying hens of today originate from the jungle fowl of the Indian Subcontinent. The hen's ability to lay clutches of eggs has been utilised to develop the birds we have now, who lay an egg nearly every day, without the need for fertilisation. At around 72 weeks of age, a hen will have produced approximately 300 eggs[1]. In their natural environment, hens spend much of their time foraging for food. This means that they are highly motivated to perform behaviours such as searching, pecking and scratching. Trees are frequently used for perching at night to avoid predators. Prior to laying, hens build a nest to lay their eggs in. They carry out feather maintenance behaviours including preening, dust-bathing and wing flapping. These are often called 'natural behaviours', behaviours that are typical for chickens.

In the farming systems we have today there are several distinct phases in the life of a hen. Laying birds are born in a hatchery and moved to a rearing site. Prior to the start of lay, they are moved to a particular housing system (unless they were reared on site but they will still move sheds) until the end of lay, when they are slaughtered. This document gives an overview of each stage in the hen's life from:

The hatchery

The birds used to produce laying hen stock have their eggs taken away and placed in an incubator. Here the eggs are kept in an optimum constant atmosphere and regulated temperature. At 21 days the chicks are ready to hatch, using their egg tooth to break out of their shell (the mother would help in the wild). Chicks are precocial, meaning that immediately after hatching they are relatively mature and mobile. A chick classified as a 'day-old chick' is up to 72 hours old (this is when the yolk sac runs out). Currently, chicks destined for organic systems are not treated differently until they get to the rearing farm.

- **Sexing:** After hatching the birds are placed on a conveyor belt and sexed. The females are kept and the males are killed, by either gassing or maceration (which is believed to be more humane than gassing[2]). Chicken breeds have been developed to either produce meat or lay eggs, so laying breed male chicks are not suitable to be reared for meat. Currently, in the UK chicks are most often gassed as there is a market for day old chicks to feed reptiles[3].

- **Beak-trimming:** The female chicks intended for enriched cages, free range and barn systems will usually have their beaks trimmed. In some countries caged birds may not have their beaks trimmed. It is not routine in organic systems to beak trim and some organic schemes ban it completely (e.g. UK Soil Association).

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EU law allows trimming before the age of 10 days and only up to a third of the beak can be removed. In other countries the beak may be trimmed more and by a sharp (hot) blade.

Vaccination and parasite control

Chicks (including organic chicks) are vaccinated against 6 - 8 different viruses from day old to 16 weeks of age. Marek's disease and Gumboro disease can cause death but it is almost 100% controlled by vaccination. While vaccination can help prevent respiratory disease, air quality and temperature control are crucial for disease control[4]. Vaccines are delivered via injection, drinking water or environmental spraying ('course spraying').

Salmonella is controlled in some EU member states by vaccination (e.g. British Lion Code, which over 95% of UK producers are accredited to, stipulates vaccination[5]). In other parts of the world there is a high prevalence of salmonella and only a small uptake of vaccination. Anti-coccidial drugs are also given to help prevent coccidiosis, a parasite that infects the gut of birds, causing mortality in chicks and affecting productivity in laying hens.

The red mite is a blood-sucking parasite that lives on the skin of birds causing severe skin irritation, reduced egg productivity and sometimes death. It can be a serious problem in both cage and non-cage systems and is difficult to control[6]. Treatment includes disinfecting buildings and aerosol sprays. Worm parasites can also be a problem particularly for birds on pasture and are treatable with anthelmintics.

Transport

Laying hens are transported more often in their lifetime than for example meat chickens: they are moved from the hatchery to the growing site (as 'day-old chicks') and then on to the production farm for laying (except some organic birds that are reared and lay on the same site). At the end of lay, the birds are transported to a slaughterhouse[7]. When moving from the hatchery at a day old it is crucial that there is minimal stress and the correct environment is maintained. The transport conditions for chicks are believed to influence the bird's health and growth rates for the rest of her life[8].

These crates are used to transport birds to their next destination.

Pullets are typically reared in barns on litter.

Pullets

A pullet is a young laying hen before she reaches maturity. Pullets are normally raised at a growing site, typically a barn system although more farms are beginning to rear in the type of systems that the birds will eventually lay in, to make the transition from rear to lay more predictable and less stressful[9]. At the age of around 16 weeks the pullets are generally well-feathered and have a greater ability to thermo-regulate, at which point they are transported to the designated system for laying.

Point of lay

Hens reach point-of-lay (when a bird starts to lay eggs) at about 19 weeks of age. She will have already been living in the laying system with carefully managed lighting to control the point of lay for a few weeks prior to coming into lay. Below is a graph showing the average number of eggs laid over the hen's commercial life span.

<u>The number of eggs commercial hens lay on average over their laying period</u>

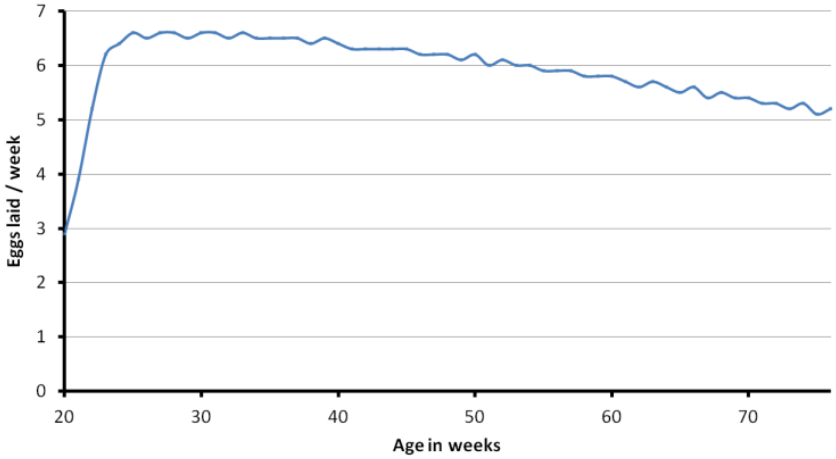


Fig. 1. This graph shows the average number of eggs laid by Lohmann Brown classic hens (one of the main breeds of laying birds) per week from start of lay to 76 weeks, housed in colony cages[10]. Birds' peak lay period is from 25 to 39 weeks of age when they lay on average nearly one egg per day.

Barren battery or conventional cages

A barren battery cage in Brazil. This system is now banned in the EU. The birds are unable to flap their wings or perform most of their other natural behaviours.

Cages are typically metal wire and approximately 50cm x 50cm in size with a trough for feed, nipple drinkers and a sloped wire floor so the laid eggs can roll out. There is no nest space, perch or litter to scratch and dust bath but do often have a claw shortening device. The arrangement of cages ranges from single tiered to vertically arranged stacks of up to 9 tiers high. Inspection of birds in higher tiers can be difficult. The cages are indoors in huge sheds with a controlled environment and no daylight. The number of birds in one shed can vary from hundreds to hundreds of thousands. Farms may have over a million hens but in a number of sheds.

Europe banned the battery cage in January 2012. Countries outside the EU do not have any regulations for battery cages; in places such as the USA and India typically there may be as many as 8 -10 birds in a cage that would have housed 5 birds in the EU.

Enriched / furnished / colony cages

Enriched cages (also sometimes called modified cages) are similar to conventional battery cages but provide more space and height, a nest box area, at least 15cm of perching space per hen, a small area of litter and a claw shortening device. They come in a range of sizes. Smaller ones may house fewer than 10 birds (the only type allowed in Sweden). The larger and more widely used versions house 60 - 80 birds and are called colony cages. The birds have an area of 750cm^2 per hen. From January 2012 this became the only cage system allowed for laying hens in the EU. Outside the EU enriched cages are uncommon. A discussion has now started in the USA about banning battery cages.

A colony cage is an enriched cage that houses 60 – 80 birds, with furnishings including a perch, nest box and litter area.

*Lighting schedule**:*** Hens in cages are commonly kept in closed sheds with artificial lighting and fan-driven ventilation. The lighting is usually kept low to reduce the hen activity levels but is kept on during many of the hours of darkness in winter in order to keep the hens laying all year round. In the EU hens are required to be provided with a period of darkness of around eight hours in every 24 hours. Caged hens will never experience natural light or fresh air and never leave their cages until they are removed at the end of their laying life for slaughter.

Barn Systems

Multi-Tier (aviaries): The most modern design is known as the portal aviary, where the birds are housed in a barn with litter on the floor and several tiers or platforms for perching and other activities. Hens tend to use the different tiers for varying behaviours such as scratching on lower tiers, preening on the intermediates and perching higher up at night. This system allows birds more freedom to move away from each other, which helps to reduce feather pecking.

Nest boxes along with feed troughs and nipple drinkers are provided on several tiers. Other housing systems may have aerial perches, which can be an A-frame, a pole or other resting place raised above the ground. The maximum stocking density is 9 birds/m^2.

Multiple tiers allow hens to choose different levels to perform their natural behaviours and escape other birds more easily.

Single-tier (barn systems/percheries): Typically only have one single tier (it varies as to the addition of aerial perches), part-litter, part raised perforated floor with the perches incorporated. Nest boxes, nipple drinkers and feeding troughs are all provided. This system is stocked at up to 9 birds/m^2.

A single tier system gives birds the opportunity to perch. Hens are stocked at up to 9 birds/m^2 in the EU.

A wintergarden is a run area attached to a barn that allows birds additional space to dust-bath in litter and experience natural light.

Wintergarden: This is a littered, covered area additional to the main shed. Popholes allow birds access to the wintergarden from the shed. It is covered with wire netting, so is airy and naturally lit. Sometimes this area is called a verandah. By providing wintergardens at an early age, birds are encouraged to range later on in life when they are housed in free-range systems. The wintergarden area is not normally included in the calculation of the official floor space available to the hens as they do not have access to it at night.

Free-range

Hens in free range systems are given access to an outside range. The housing provided is either a fixed shed or a mobile house that can be moved around the pasture. The buildings are the same inside as barn/aviary systems. Popholes allow access to the range. At night the hens come inside for protection from predators and to ensure eggs are laid in the nest boxes. The pasture area outside requires shelter to encourage birds to range further. Laying hens use a range more if it is of good quality (e.g. with presence of cover in the form of trees, bushes or hedges or with artificial shelters[11]). Natural cover such as trees can also help reduce levels of injurious feather pecking[12].

Free-range systems give access to pasture and allow birds to exhibit all their natural behaviours. Trees help encourage birds to range.

Organic hens are free range. Birds reared under UK Soil Association certification require access to range from at least 12 weeks, preferably sooner (therefore before point-of-lay) to help encourage ranging in later life[13].

End of lay

At about 60-70 weeks of age, egg production will slow down and this is called 'end of lay'. The birds are referred to as 'spent' hens. At approximately 72 weeks old the birds are removed (called depopulation) and transported to the slaughterhouse. In many countries there are fewer abattoirs with facilities for slaughtering laying hens and birds often travel much further to a slaughterhouse than meat chickens (broilers).

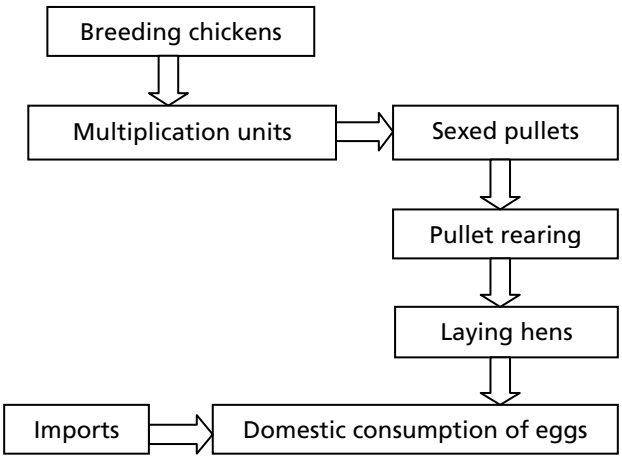
Moulting is a natural process where birds lose old feathers and grow new ones. At this time, the hen also stops laying eggs, allowing her reproductive tract to rejuvenate. This is normally brought on by reduced daylight hours. In industrial systems in countries such as the USA and throughout Asia, birds reaching the end of lay will be starved for 1-2 weeks to artificially stimulate the moulting process. The hens then return to lay with a higher egg yield than

prior to the end of the last period of laying. This is banned in Europe and India due to the welfare issues associated with starvation to induce moulting.

Breeding lines (parent birds) for producing laying hens

Globally, there are just two companies which own the breeds that all commercial laying hens originate from – Hendrix and Lohmann, offer around 15 different breeds between them[14]. The birds are either brown, white, black or a combination of these and the breeds have slightly different characteristics but have all been selected for high egg output. Traditional breeds are generally not used on large commercial farms. Breeding stock birds produce different lines of offspring with varying genetic advantages. As breed lines are developed, only the desired sex is reared, the other is killed after hatching. Within the breeding stock there may be mutilations to the male birds including dubbing (the removal of the comb) and de-spurring. Both female and male birds may have their beaks trimmed and the last joint on the medial and back toes cut off. Breeding stock tend to be reared in a barn system.

Diagram 1: The different stages in production from breeders (parent stock) to egg layers



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