Important considerations for managing fully beaked flocks – part one

Due to changes in customer sentiment, restrictions on beak treatment practices have been introduced in some countries and are being considered by many others. Full (untreated) beaks are obligatory in European Union organic flocks, and this practice is being voluntarily extended to more barn and free range flocks on a customer by customer basis.

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Management of fully beaked flocks requires more consideration and input relative to beak-treated flocks. This article outlines areas which should be considered by farm managers, nutritionists, and health professionals.

There are key factors to consider in managing fully beaked flocks.

- Pullet quality.
- Lighting.
- Ventilation.
- Environment.
- Feeding system management.
- Nutrition and diet nutrient specifications.

Pullet quality

The goal for rearing flocks with full beaks is to transfer the hens with excellent feather cover, good behavioural attributes, good body weight, and high body weight uniformity with good overall body condition. The better overall condition a pullet flock is going into transfer, the better its behaviour and feather condition will be throughout the lay period.

While management is a critical component of success for fully beaked flocks, genetics also play a role. Hy-Line varieties have been bred to be particularly calm, sociable, and tend not to express aggressive behaviour during stress events.

In a recent set of both internal and university studies assessing the performance of non-beak-treated flocks, Hy-Line Brown resulted in significantly lower mortality relative to other breeds (Fig. 1).

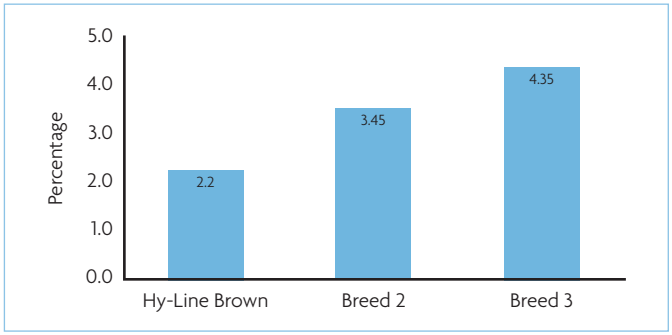
Rearing can have a significant impact on the behaviour of the birds later in life. Sociable birds in rear tend to stay sociable in the laying period, while those flocks that exhibit anti-social behaviour in rear tend to maintain this behaviour in lay.

Factors contributing to good flock behaviour

- **Uniformity:** Good uniformity will correspond with better flock cohesion and behaviour.

- **Feather cover:** A poorly feathered bird at point of lay is more prone to stress during the laying period. Factors that contribute to feather quality include proper growth, nutrition, disease, management, overall stress, and uniformity. Pullets undergo three moults to transition from chick down to adult feather cover. To achieve the best feathering, the pullets must be healthy and free of stress for the duration of feather growth.

Fig. 1. Average mortality of two fully beaked flocks (50.4 weeks in lay).



Use of an elevated platform in a rearing house.

- **Environmental conditioning:** Hens that are less excitable due to external stimuli will be less stressed and more sociable.

Rearing recommendations

- Ensure there is adequate provision of litter at all times through rear. An inadequate amount of litter in rear can result in feather pecking behaviour later in lay.

- Condition pullets in rear to audio and visual stimuli. Mechanical noises such as initiating the feeding system is a good way to condition the bird to spontaneous noise. Use of a radio in the rearing house will familiarise birds to sounds.

  Flock managers should walk frequently inside the house among the birds to accustom them to human contact. Changing the colour of clothes and footwear frequently will also help condition birds to visual stimuli.

- Adapt rearing birds to the equipment and furniture used in the laying house. Provide adequate perches/slats in the rearing house and use the same feeding system as that used in the laying house. Chain feeding systems are often used in free range and aviary systems as they are associated with less feed selection and wastage, so introduction of this system in the rearing house aids familiarisation.

- Enrich the bird's environment with perches, elevated platforms with feed and water, foraging material, pecking blocks and dust baths. These enrichments can prevent feather pecking and should be introduced at an early age.

- Stock birds at recommended rates to provide sufficient feeder, drinker, and floor space to minimise social stress.

- Achieve optimal body weight, conditioning, and uniformity by the end of the rearing period. Body weights should ideally be 100-150g above the breed recommendation at 18 weeks with 85% uniformity.

Fig. 2. Intermittent lighting programme for chicks.

Natural daylight in rearing and laying houses.

Lighting

The pullet lighting programme is essential in supporting overall body weight and feather growth in rear. There are three main components to any lighting programme: the initial step-down, the constant period, and the stimulation.

Intermittent lighting and step-down

An intermittent lighting programme for chicks should be used from 0-2 weeks of age. This programme provides (Fig. 2) cycling of light and dark periods, which provides the chicks periods of rest throughout each 24-hour period. The resting and activity behaviours of the flock are synchronised.

As chicks have not yet developed a circadian (24-hour) rhythm, the intermittent programme can be modified to fit the farm's work schedule.

The recommendation is to provide between 3-6 dark periods, ranging from 1-2 hours each, which can be adapted for flocks exposed to natural light during the day.
Light intensity from 0-3 days of age should be 40-50 lux, reduced to 25 lux by the end of the intermittent lighting programme.

Reduce intensity to 10-15 lux no later than four weeks of age and continue until up to two weeks prior to stimulation.
Lighting must be LED and flicker-free to minimise stress:

- 3,000-5,000 Kelvins in rear.
- 2,700-3,000 Kelvins in lay.

After the conclusion of the intermittent lighting, provide 18 hours of constant light with six hours of dark and start the step-down portion of the lighting programme. Utilise a slow step-down programme to reach 10-12 hours day length by 10-12 weeks of age.

Constant lighting period

● **Day length:**
Consistent day length starting at 10 or 12 weeks until stimulation. The duration of consistent day length is predicated on the history of the farm, season, and the time of natural light that will be present by 16 weeks of age.

A longer consistent day length will allow for more feeding opportunities and will enhance growth if needed for warm weather or challenging conditions.

The body weight goal for fully beaked flocks is at least 5% above standard. If birds are not 5% above target by eight weeks of age, adjust the lighting programme to allow for a longer consistent day length. Ensure the period of consistent day length is a minimum of three weeks after the step-down is complete.

● **Lighting type and intensity:**
To limit the stress at transfer, match the lighting programmes (duration and intensity) and type of lighting (for example, LED) in both rear and lay houses. Maintain the same light intensity for the first 3-4 days after transfer to allow the birds time to adapt to the new environment.

After this period, implement the laying lighting programme. Exposure to some natural lighting in the rearing house can help to customise birds to natural lighting if this is stipulated in the laying house.

Stimulation and lay house

● Stimulate hens based on achieving the target body weight. The Hy-Line Brown should be stimulated no lighter than 1,350g and no earlier than 15 weeks of age.

Delaying light stimulation until 1,500g may help increase average egg weights. Use a one or two-hour initial stimulation. The goal is to reach 15-16 hours of total light by 24 weeks of age.

● Adapt light intensity to the behaviour of the hens, although interior light intensity may be controlled by local legislation. The recommendations are 20-30 lux at the level of the feed troughs or litter floor in aviaries. Hens might be exposed to much greater levels with windows, curtains, or free-range access. Lower light intensity inside the shed will help calm birds if necessary.

● Ensure that direct light does not shine into the nest box area and it is safe for birds to lay eggs without intrusion by other birds. Injurious pecking of the vent can occur in the nest when the vent is temporarily protruded after laying an egg.

A natural ventilated house with circulatory fans.

Ventilation

A poorly ventilated environment increases stress and leads to feather pecking behaviour. When ammonia levels in a laying house exceed 15ppm, the incidence of feather pecking increases by 10%.
Similarly, as CO_2 levels increase by 100ppm, the incidence of feather pecking increases by 15%.

The ventilation system should be effective in removing CO_2, ammonia, moisture, dust, and excess heat from the house environment. As every house ventilates differently, it is strongly recommended to consult a specialist to ensure that the ventilation system is operating optimally.

Negative air pressure ventilation systems are managed so that air is drawn from side inlets to the roof, where incoming air mixes with warm air and then circulates down through the house. This provides a homogeneous air temperature within the house and avoids cold air dropping from the air inlets directly onto the litter area, creating damp areas. Positive pressure houses push exhaust air through vents and popholes, preventing cold, damp air in winter from entering the house and causing wet litter. Natural ventilation systems rely on thermal buoyancy. Birds generate warm air, which rises and is released through a ridge vent.

As warm air exits, fresh air from outside the building enters the house via side inlets. Natural ventilation is influenced by outside weather conditions and more challenging to manage than mechanically ventilated systems. Natural ventilation, however, is generally not recommended where outside temperatures exceed 33°C.

Ventilation recommendations

1. Heat the house before birds arrive from the rearing farm; the laying house must be warm as birds arrive.
2. Ensure the environment within the laying house is optimal: 18-25°C and 40-60% humidity.
3. Avoid gases exceeding maximum allowable levels (Table 1).
4. Provide sufficient air circulation with use of supplementary fans during hot weather to aid cooling. ■

Part 2 will be published in a future issue of International Poultry Production

Table 1. Maximum allowable levels of noxious gases (measured over eight hours).

Gas	Max allowable level
Ammonia	‹15ppm
Carbon dioxide	‹5,000ppm
Carbon monoxide	‹50ppm