



MANAGING

FOWL
BEHAVIOUR

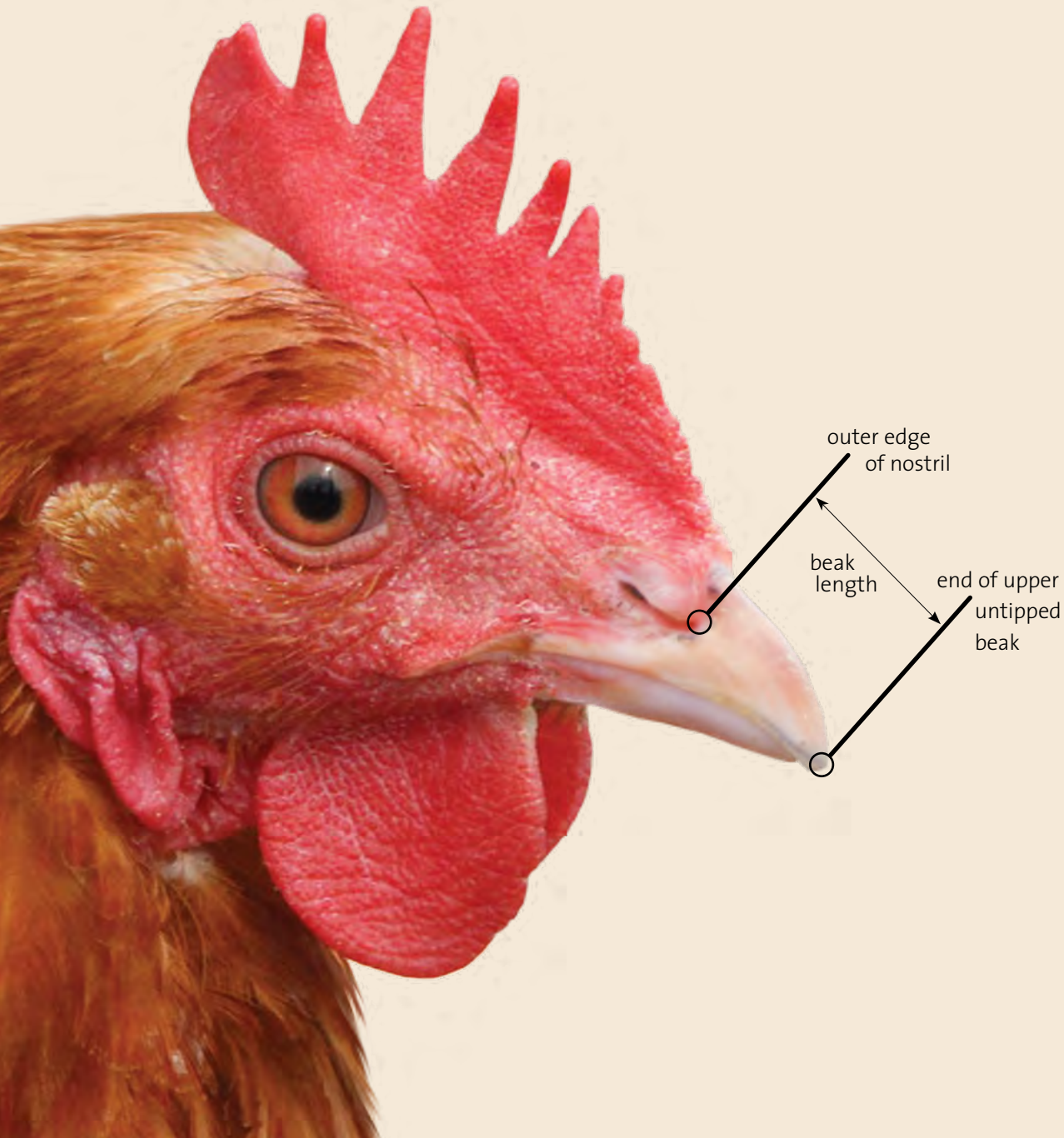


**A best practice guide to help manage
feather pecking and cannibalism in
pullet, layer and breeder flocks**

PHIL GLATZ AND GEOFF RUNGE

This handbook uses the following definitions for beaks.

- **Tipping** removes a portion of the upper and lower beak by any method.
- **Treatment** uses infrared technology to treat the beak of day old chickens which results in a portion of the beak sloughing (or shedding) off by two to four weeks of age.
- **Trimming** removes up to one-third of the beak using the hot blade technique or other cutting tools at any age.
- **Length** is measured from the outer edge of the nostril (or nares) to the end of the untipped upper beak, or if tipped then to the end of the shorter beak, whether it is upper or lower.



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Acknowledgements

We thank all those who gave of their time and knowledge and so assisted us in developing this handbook.

Our special thanks go to:

- Dr Kelly Drake for her invaluable insight on feather condition, pecking and cannibalism, Dr Greg Cronin for his observations and knowledge on feather pecking and cannibalism, and Dr Greg Parkinson for his knowledge and observations on pullet uniformity, feather pecking and cannibalism.
- Dr Claire Weeks and Dr Thea van Nierkerk for information on pecking blocks.
- Dr Karen Schwean-Lardner for her knowledge and insights on beak treatment.
- Contract beak trimmers for assistance with hot blade trimming techniques and score sheet development and evaluation.
- Poultry farmers who evaluated the beak tipping and feather scoring sheets, commented on prevention strategies and allowed us to observe flocks in various production systems.
- Management staff at hatcheries for allowing observation of beak tipping, discussion on pecking and cannibalism preventative strategies and scoring of beak tipping.
- Staff at Nova-Tech Engineering for technical assistance and information about the infrared beak treatment machines and beak treatment.

Managing fowl behaviour: A best practice guide to help manage feather pecking and cannibalism in pullet, layer and breeder flocks

Authors: Dr Phil Glatz and Geof Runge

Contributor: Dr Kelly Drake

Editor: Dr Bronwyn Runge

Design: Angel Ink

Referees: Australian Egg Corporation Limited Research Advisory Committee

ISBN 1 920835 58 X

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Enquiries: Program Manager–RD&E
Australian Eggs
Level 4, 107 Mount Street
North Sydney NSW 2060
AUSTRALIA

Tel 02 9409 6999

Fax 02 9954 3133

Email research@australianeggs.org.au

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Foreword



Cannibalism and feather pecking can be a significant problem for poultry farmers and breeders in Australia. Such behaviours are a source of production loss and reduced wellbeing of birds. There are a number of on-farm strategies to reduce cannibalism and feather pecking that can be complemented by infrared beak treatment, with the last resort being beak trimming by a hot blade.

This handbook provides poultry breeders, pullet rearers and layer farmers with the resources to prevent cannibalism and feather pecking. It provides an overview of the problem, the various solutions available to manage it and resources that can be used by farm managers as a ‘benchmark’ tool to compare their current strategies with those considered to be best practice. The handbook focuses on management strategies that do not require any beak tipping. Some of these methods and strategies will become more viable as further research is carried out to ensure their effectiveness in reducing the stressors that trigger feather pecking and cannibalism and maximising bird welfare.

The 2001 Australian Poultry Welfare Code (currently being revised) puts the responsibility onto poultry farmers (including broiler and layer breeder managers) to make every attempt to prevent feather pecking and cannibalism in birds by selecting the most appropriate breed or strain, housing and management practices. These include making adjustments to stocking density, lighting, temperature, humidity, removing pecked or injured birds and those instigating the pecking. If these measures fail to control the problem then in consultation with an expert in poultry husbandry beak tipping should be considered as a last resort to prevent further injury or mortality in the flock.

If beak tipping is to be used, infrared treatment of day old chicks is the least stressful method. It is expected that where hatcheries are using the infrared method, only appropriately trained staff will carry it out. Layer farmers and breeder managers should work closely with the hatcheries and treatment teams to ensure that the maximum amount of upper and lower beak tissue is retained without sacrificing control over feather pecking and cannibalistic behaviours.

Layer farmers and breeder managers also use hot blade beak trimming as a last resort if mortality from cannibalism occurs during the rearing and laying period. It is a requirement of the Welfare Code that beak trimming (or tipping) must be performed only by appropriately trained personnel. Australian Eggs will make available a training program to enable accreditation or reaccreditation of hatchery, farm and contractor personnel undertaking hot blade trimming.

This handbook provides the how, when and why beaks are tipped using infrared treatment or hot blade trimming and how birds respond. This information can help managers take better care of birds following the tipping procedure.

The underlying causes of aggressive, severe or vent pecking in layer hens has been the focus of research around the world for many years. While the causes are not yet fully understood the knowledge gained from this research has allowed the development of strategies that will help to minimise pecking and improve the wellbeing of hens in modern production systems.

This handbook explains the stressors known to increase the risk of feather pecking and cannibalism in poultry and provides strategies and monitoring procedures that can be implemented by those who are responsible for the wellbeing of hens on their farm.

Structure of this handbook

At the end of each chapter is a summary of issues covered, a review of activities and best practice guidelines that should be followed.

Checklists and work instructions are included in the appendices of this handbook to assist in implementing and monitoring of pecking prevention strategies. These are followed by a glossary, a further reading section and some useful websites.

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FEATHER PECKING AND SUBSEQUENT CANNIBALISM
IS A SERIOUS WELFARE PROBLEM IN THE POULTRY
INDUSTRY.

This chapter will help farm managers
recognise pecking and cannibalism
problems in poultry.

Chapter 1



RECOGNISING PECKING PROBLEMS

You should be able to:

- recognise the signs of cannibalism
- recognise different types of feather pecking
- recognise a bird's position in a pecking order.

1.1 The peck order

Despite a considerable effort directed towards understanding the causes of feather pecking, the problem still exists and remains one of the largest welfare and economic problems in the laying hen sector. Feather pecking is a multi-factorial problem that can be influenced by genetic background, early life experience and the environment of the bird.

Feather pecking was originally thought to occur as a result of redirected foraging and/or dust bathing behaviour. Recent research suggests that feather pecking birds are more active and may become frustrated when their environment lacks the stimulation they need and express this frustration by feather pecking. In mixed sex breeding flocks, cockerels will engage in aggressive feather pecking at females and subordinated males in the group.

Pecking is a specific behaviour of poultry. Within a flock or group of hens, establishment of the pecking order or dominance hierarchy is important and is usually done when one bird or several birds dominate the others. This is done aggressively, by way of pecking, to form the peck order. Attacks include threats where one bird lifts its head above the others and then pecks the comb, head, neck and wattles and chases the other bird, which will display submission by crouching. The peck order in a flock can change if new birds are introduced or the dominant bird is injured or defeated in an attack.

When two birds fight they peck, kick with their feet and slash with their spurs.

1.2 Feather pecking

Allo-pecking is defined as pecking of other birds. It involves a hen approaching another hen from behind or from the side, and pecking at the feathers. Hens being pecked will not generally pay any attention at first, but may move away after receiving a few pecks or if the pecking continues.

Gentle feather pecking without removal of feathers usually causes little damage and can include feather pulling (no feather removal), gentle pecking and stereotypic (or repetitive) pecking.

Severe feather pecking includes feather pulling and feather removal which can result in damage and lead to bleeding from the skin (from pecking at bare areas of skin or when pin feathers are removed leading to bleeding).

Self pecking or self mutilation is pecking directed by the bird at itself causing injury.

Aggressive pecking is pecking by a bird usually directed to the head of another bird. Body and head position is important during pecking. Dominant cockerels in breeder flocks will often make aggressive pecks at hens and subordinate cockerels in the flock.

Gentle pecking occurs naturally in a flock. It may progress from a gentle peck to severe feather pecking which causes injuries and in its most severe form can lead to cannibalism, if action is not taken to prevent this happening.



Gentle pecking.

Types of pecking and distinct pecking events

	Types of pecking	Signs	Injury	Management
Potential progression ↓	Gentle feather pecking	No feather loss Normal behaviour Usually ignored by recipient Limited feather eating in rearing is beneficial ⁽¹⁾	None	Monitor
	Severe feather pecking	Feather loss Abnormal behaviour Forceful feather removal or breakage Recipient may squawk/move away Feather sucking, toe pecking	Progresses to injury	Monitor and management action
	Targeted pecking at bare body areas	Severe feather pecking particularly base of tail ⁽²⁾ Injuries, blood ⁽³⁾ , cannibalism	Severe mortality	Urgent management action
<i>Distinct pecking events</i>				
↓	Aggressive feather pecking	Pecking delivered to recipient's head Aggressor has upright body posture Dominant bird pecks subordinate bird Extreme in cockerels	Variable: low to high Occasional death	Monitor and management action
↓	Vent pecking	Pecking at vent tissue of recipient Relatively rare	Variable: low to high Often death	Urgent management action

1. Some feather eating during rearing is considered beneficial, however a threshold may be reached, after which feather pecking may occur.
2. Frequent target for severe pecking injuries.
3. Presence of blood can further encourage feather pecking.

Aggressive feather pecking and vent pecking can be considered as two different types of pecking events quite distinct from severe feather pecking and not necessarily related to it. Aggressive feather pecking occurs when an aggressor bird directs pecks toward the head or comb of a recipient bird and is more commonly seen in male birds. Vent pecking is directed at the vent area, and can occur independently of feather pecking. It is more likely to occur when cloacal mucosa is exposed as pullets first come into egg lay. Birds will also peck at the vent area of another bird on a perch if the perch is not located correctly. Bright light in nesting areas may contribute to vent pecking by making the vent more visible. Vent pecking can occur sporadically and a flock may potentially 'recover' from vent pecking. This is different from severe feather pecking, where it is generally found that once feather pecking starts in a flock it can be extremely hard to stop.

1.3 Feather eating

Feather eating by birds begins during the pullet growing period. As pullets grow they continually lose some of their feathers onto the floor litter (rice hulls, sawdust, etc.) and other birds will consume these feathers. If there is a lack of these feathers in the litter (especially short feathers less than 10 centimetres) birds may peck at, and remove, short feathers on other birds. This can potentially lead to feather pecking later in lay and may result in injuries during the pullet growing period. A few short feathers on the litter may be an early indicator of potential pecking problems.



Pecking at the base of the tail.



A raw wound attracts other birds to join in usually leading to the death of the pecked bird.

Photo courtesy of G. Cronin, University of Sydney.

Birds are attracted by the oil on the surface of feathers and around the uropygial gland (oil or preening gland) at the base of the tail. There are some feather-pecking birds that are strongly motivated to pluck and eat feathers even when they are provided a good litter substrate. These birds tend to be hyperactive in the flock.

1.4 Cannibalism

Causes of cannibalism

There are many causes of cannibalism. Common factors are boredom, frustration, misdirected foraging, vent pecking (if perches/structures in the shed are at an incorrect height) and pecking at other birds while they are dust bathing. Often outbreaks occur in one shed, while birds in similar housing, or fed on the same feed in other sheds on the same farm, do not develop cannibalism. Severe feather pecking does not always precede the onset of cannibalism.

Signs of cannibalism

Outbreaks of cannibalism are easy to recognise. Birds will have areas of the body that are blood stained, with broken skin, raw wounds and injured vents. Cannibalism in a cage is usually caused by one bird engaging in feather or vent pecking, and other birds in the cage may join in. Once pecking starts in either caged birds or birds on the ground it is difficult to stop and all birds may either be pecked or engage in pecking. Tissue damage will often be caused by birds pecking at the vent of other hens as the cloacal tissue is everted when the egg is laid.

Most of the cannibalism generally starts with pecking around the tail and vent. Birds will peck at the base of the tail, lower abdomen and vent, leaving gaping holes. Flocks that appear normal can quickly become cannibalistic and birds can be killed within 15 minutes. Bare, exposed skin is vulnerable to deep scratches and some lesions can be as long as 15 centimetres and up to 3 centimetres deep.

If vent pecking arises in cages, all birds in the cage should be examined for pecking damage by everting the oviduct to inspect the surface of the cloaca and the lower part of the reproductive tract.



Photo courtesy of G. Cronin, University of Sydney.

Tissue damage caused by pecking at the base of the tail.

1.5 Tissue pecking in bare areas

Severe feather pecking is often directed at bare skin and leads to an injury. Other birds are then attracted to join in the behaviour and the pecked bird usually dies.

1.6 Vent pecking

Pecking at skin and tissue surrounding the vent is the severest form of pecking behaviour. This form of pecking may be directed at the small downy feathers below the cloaca or at the partly everted cloaca as an egg is being laid. Birds seem to peck this area more voraciously than other parts of the body. Once birds have developed a taste for blood they usually continue their newly-developed habits.

This behaviour often results from poor management (e.g. inappropriately placed equipment, light effects), poor beak tipping (the offender usually being a bird that has not been beak tipped correctly) or environmental factors.

The damage inflicted can affect the strength of the vent and a prolapse is likely to occur. A prolapse can also occur when overweight pullets start laying, when pullets have received an incorrect light program, when an incorrect diet causes large eggs early in lay, or when a flock has not been reared uniformly and has under-developed pullets. Cannibalistic pecking is responsible for at least 80 per cent of all vent prolapses.

Severe feather pecking is a strong risk factor for both cannibalism and vent pecking. There is uncertainty around the causal relationship between severe feather pecking and vent pecking. It can be difficult to stop severe feather pecking but vent pecking can potentially be stopped or reduced by increasing ranging ability and keeping light levels low in nest boxes. Increasing the light period at a later age during rearing or prelay reduces the risk of vent pecking. Minimising body weight variation in future flocks will assist in preventing vent pecking.

Birds coming into lay already under stress from metabolic, hormonal and behavioural changes can be stressed further with housing and environmental changes. It is important for pullets to have full access to feeders, drinkers and nest boxes over the critical period leading up to and following laying their first egg.

Range reared pullets are likely to have higher cannibalism and vent pecking events than birds reared indoors due to the higher light intensity outdoors.

In free range flocks the risk of vent pecking can increase when birds are given their first access to the verandah or range at one to two weeks before peak production but this risk decreases when birds are given their first access after peak egg mass.

Vent pecking can increase with larger pop-holes as higher light intensity at these points exposes a bird's vent more clearly for other birds to peck at and can be lessened by providing an even spread of light around openings and in the house. Competition between birds can also result in pecking as they exit the shed.

Other increases in vent pecking may be caused by:

- the lowest perch being more than 0.5 metres above the litter or slats
- use of bell drinkers
- birds accessing nipple drinkers pecking at birds using drinker lines as perches.



Perches may also increase the risk of cannibalism if not managed correctly especially when birds can reach and peck at other birds on the perches in front of them. It is important to have perches placed appropriately to prevent this type of pecking.

The best practice to prevent cannibalism and vent pecking in free range birds is to manage pullet uniformity and age of onset of lay, and to encourage range use once peak egg mass/production has occurred. It is difficult to achieve uniformity when pullets are exposed to natural light such as when they are reared in naturally ventilated housing or when they have access to the verandah or range.

Feeding and lighting strategies are important in managing uniformity, however lighting strategies are difficult to manage under the influence of natural light.

Pecking at skin and tissue surrounding the vent is the severest form of pecking behaviour.

1.7 Toe pecking

Toe pecking is commonly seen in domestic chicks. Strong light illuminates the blood vessels in the toe attracting other chicks to start pecking. It is a serious vice among young chicks reared on dark coloured litter and can lead to an increase in mortality and a reduction in growth.

Toe pecking is often caused by strong light, hunger, excessive warmth and toe trimming.

1.8 Head pecking

Head pecking is directed by dominant birds at those lower in the pecking order causing the recipient to squawk. In severe cases, areas above the eyes can become bruised, and wattles and ear lobes become swollen. Even if birds have been beak tipped and are kept in separate cages they can still reach through the cage and peck at a neighbour, grasp its ear lobe or wattles and shake its head.

1.9 Mitigating the risk of feather pecking and cannibalism

Farmers should consider strategies that minimise feather pecking and cannibalism to reduce the need for beak tipping. This handbook discusses approaches farm managers can use to ensure best practices are adopted.

SUMMARY

- Pecking without removal of feathers usually causes little or no injury.
- Dominant birds peck at birds lower in the pecking order.
- Feather eating is common in the growing period, however if limited numbers of short feathers are available it may lead to pecking feathers from other birds.
- Tissue damage results from feather removal, feather pulling and severe pecking.
- Common factors related to cannibalism include boredom and frustration, misdirected foraging, pecking at birds while they are dust bathing and light intensity.
- Cannibalised birds are blood stained, with broken skin, raw wounds and injured vents.
- Pecking below the vent is the severest form of cannibalism.
- Toe pecking is a serious vice among young chicks.

REVIEW ACTIVITIES

1. How much of a problem is feather pecking on your farm? (Use a cross.)

None	Moderate	Severe

2. What types of pecking do you encounter on your farm?

- Toe
- Tail
- Head
- Bare skin
- Vent
- Feather

3. What percentage of deaths from cannibalism is occurring or has occurred on your farm?

- Worst _____ %
- Average _____ %
- Least _____ %

BEST PRACTICE

- Staff should have the skills to recognise the different types of pecking including injuries and cannibalism.
- Cannibalism should be less than 1 per cent of mortality over the life of the flock.

THE WELFARE CODE PLACES RESPONSIBILITY ON THE FARM MANAGER AND STAFF TO MINIMISE FEATHER PECKING AND CANNIBALISM IN POULTRY FLOCKS UNDER THEIR CARE.

This chapter will help you understand the responsibility that farm managers and staff have to minimise feather pecking and cannibalism in birds.



Chapter 2

POULTRY WELFARE CODE

You should know:

- what the Australian Model Code of Practice for the Welfare of Animals–Domestic Poultry 4th Edition 2002 (‘Welfare Code’) is, and the relevant state government animal welfare or cruelty legislation and regulations
- staff bear responsibility in the Welfare Code for checking and inspecting poultry and identifying ill-health and distress
- what actions the Welfare Code requires to minimise pecking and cannibalism
- recommendations concerning beak trimming, toe trimming and spur removal
- the Welfare Code will be replaced by the Australian Animal Welfare Standards and Guidelines for Poultry in 2017.

2.1 The Poultry Welfare Code of Practice

In August 2000, the Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ) made decisions regarding poultry which were incorporated into the Model Code of Practice for the Welfare of Animals – Domestic Poultry 4th Edition 2002 (‘Welfare Code’). These decisions and the Welfare Code were later endorsed by the Primary Industries Ministerial Council (PIMC), which replaced ARMCANZ in 2002.

The Welfare Code is a guide for people who are responsible for the welfare and husbandry of domestic poultry. At the time of writing, the Code is being revised and will be replaced by the Australian Animal Welfare Standards and Guidelines for Poultry which is due to be released in late 2017.

The *Australian Consumer Law (Free Range Egg Labelling) Information Standard 2017* provides a definition of free range eggs and maximum stocking density on the outdoor range of 10,000 hens per hectare. (See Glossary on page 132.)

Everyone involved in all stages of poultry production has an obligation to maximise the welfare of poultry under their care.

The Welfare Code is a guide to managing the welfare and husbandry of poultry.

2.2 Regulation of the Welfare Code

All jurisdictions in Australia agreed to implement legislation to support the Welfare Code.

Queensland has put most of the Welfare Code into regulation whereas other states and territories have made regulations about one or more sections under their animal welfare or cruelty legislation.

Farms should comply with the Welfare Code.

Supporting legislation varies across states and territories with little uniformity across Australia. The relevant government departments use either animal welfare inspectors or RSPCA inspectors to check compliance with animal cruelty legislation.

Regulations take precedence over codes of practice in a court. However, if there is no regulation covering the offence the farmer is charged with, then the farmer can use the Welfare Code in defence by demonstrating how he/she is meeting it. Therefore, it would be prudent for any poultry farmer to ensure they comply with the Welfare Code where the requirements are unregulated.

2.3 Basic requirements for the welfare of poultry

The basic needs of poultry under the Welfare Code are:

- readily accessible food and water to maintain health and vigour
- freedom to move, stand, turn around, stretch, sit and lie down
- visual contact with other members of the species
- accommodation that provides protection from the weather and neither harms nor causes distress
- prevention of disease, injury and vice, and their rapid treatment should they occur.

The importance of good stockmanship in animal welfare cannot be over emphasised:

- people responsible for the care of poultry should be well trained, experienced and dedicated
- staff should be encouraged to undertake appropriate training in poultry management and husbandry
- knowledge of the normal appearance and behaviour of poultry is essential for those birds to be treated effectively and efficiently and with consideration.

2.4 Recommendations in relation to feather pecking and cannibalism

Inspection of poultry

‘The frequency and level of inspection should be appropriate to the welfare risk of the birds, but a thorough welfare inspection must be performed at least once each day. Inspections are best made separately to other management practices. Under certain circumstances more frequent inspections may be required, such as during hot weather or during outbreaks of disease or cannibalism.’

Staff are responsible for regularly checking birds for any signs of ill-health, distress, feather pecking and cannibalism.

Health and distress

‘Those responsible for the care of domestic poultry should be aware of the signs of ill-health or distress. Signs of ill-health in poultry include reduced food and water intake, reduced production, changes in the nature and level of their activity, abnormal condition of their feathers, droppings or other physical features. Evidence of behavioural changes may indicate ill-health or distress or both.’

Cannibalised birds will be blood stained, have broken skin, raw wounds and injured vents.

‘To prevent behavioural or other problems, layer farmers should consider selection of the most appropriate bird strain and the method of rearing used to suit the type of housing and management practices employed.

Should an outbreak of feather pecking or cannibalism occur, or an outbreak appear imminent, environmental factors that may aggravate it should be examined and if appropriate, adjustments made, such as reducing the stocking density, light intensity, temperature, humidity or disturbances to the pecking order, removing injured birds, removing birds observed to be instigating pecking, or eliminating shafts of bright sunlight. If these measures fail to control the problem then appropriate beak trimming of the flock should be considered in consultation with an expert in animal welfare to prevent further injury or mortality in the flock.’

More details on these strategies are provided in subsequent chapters.

Recommendations to control feather pecking and cannibalism include using an appropriate strain, correct lighting and a comfortable temperature.

2.5 Recommendations concerning beak trimming, dubbing, toe trimming and spur removal

Beak trimming

‘Every effort should be made to avoid beak trimming by selecting chickens for reduced feather pecking and cannibalism. The use of housing systems and lighting levels which reduce the tendency for these traits to arise should also be used.’

Infrared beak treatment is a more precise and less invasive technology that was introduced to Australia in 2003 after the Welfare Code was written. Note that trimming is the term used in the current Code.

Accreditation of beak trimmers

‘Beak trimming must be performed only by an accredited operator or under the direct supervision of an accredited trainer as part of an accreditation training program and must be performed only in accordance with agreed accreditation standards.’

Dubbing

‘Dubbing should be carried out by a competent operator soon after hatching.’

Dubbing is the removal of the upper section of the comb resulting in a smaller area of the comb being exposed to pecking damage. Dubbing is only recommended for use in strains of breeders that have a large comb. Genetic selection for birds with smaller combs is the preferred strategy.

Toe removal

‘To avoid injury to hens during mating, the terminal segment of each inward pointing toe of male breeding birds may be removed within three days of hatching.’

Toenail trimming and de-spurring

‘For all classes of poultry, except male breeding birds, toe trimming, if necessary, should be limited to the nail of the toe.

Sharp spurs on adult males may be trimmed to prevent injury to other birds.’

2.6 Recommendations on the use of fitted devices to prevent feather pecking and cannibalism

Blinkers (‘spectacles’)

‘The use of blinkers and other vision impairing equipment to prevent pecking should not be used without veterinary advice. Blinkers are not to be used in caged birds as they get caught on the wire and interfere with the bird eating and drinking.

Blinkers should be applied by a competent operator and those which damage the nasal septum must not be used.

Blinkers which may injure the bird if they become entangled must not be used.

Blinkers must not be applied to poultry unless nest boxes are situated only at ground level.’

Contact lenses

‘Contact lenses must not be used in poultry to prevent pecking as they cause eye irritation and infections and abnormal behaviour.’

Biting devices

‘The use of biting devices in poultry should not be used as they prevent complete closure of the mandibles (upper and lower beak).’

SUMMARY

- The Welfare Code is a guide for people responsible for the welfare and husbandry of domestic poultry.
- Parts, or all, of the Welfare Code are regulated in Australian states and territories.
- It is recommended that all poultry farms comply with the Welfare Code.
- It is recommended that all birds have access to food and water, freedom of movement, visual contact with other birds, a protective environment and freedom from disease, and that injury and vices be prevented.
- Staff are responsible for checking birds for any signs of ill-health, distress, feather pecking and cannibalism.
- It is recommended that farmers select a strain less prone to severe pecking, provide correct lighting and a comfortable temperature to control feather pecking and cannibalism.
- Every effort should be made to avoid beak tipping.
- Beak tipping must be performed only by an accredited operator or under the direct supervision of an accredited trainer.
- The use of blinkers and other vision impairing equipment to prevent pecking should only be used with veterinary advice.
- Contact lenses to prevent pecking must not be used in poultry.

REVIEW ACTIVITIES

1. Do you understand your responsibility under the Welfare Code? (Use a cross.)

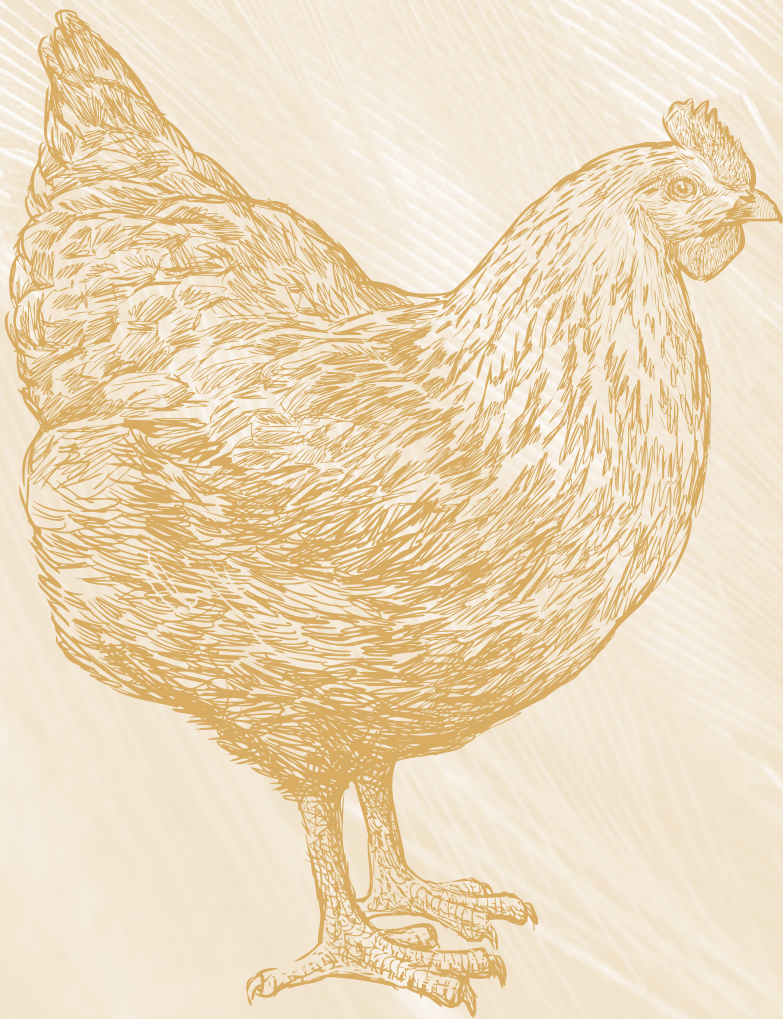
No	Partly	Yes

If 'no' or 'partly' review this chapter and the Welfare Code.

2. Which of the following are you required to monitor on your farm to meet the Welfare Code requirements?
 - Food and water intake
 - Production
 - Bird activity
 - Feather condition and droppings
 - Other physical features of the bird

BEST PRACTICE

- All farms should comply with the current welfare codes, standards or guidelines.
- When the Welfare Code of Practice is replaced by the Australian Animal Welfare Standards and Guidelines for Poultry, farms must review the farm procedures and practices and ensure that they comply with the new guidelines.



FEATHER CONDITION IS AN INDICATION OF A BIRD'S WELLBEING.

This chapter will help farm managers and stock attendants monitor feather condition.



Chapter 3

MONITORING BEHAVIOUR AND FEATHER CONDITION

You should be able to:

- understand what bird plumage is
- recognise feather damage in poultry
- score adverse pecking behaviour in birds
- score birds for feather cover and feather damage
- recognise flighty behaviour in poultry
- recognise stress sounds from poultry.

3.1 Introduction

Feather condition is an indication of a bird's wellbeing. Feathers start to deteriorate as soon as they have regenerated after either a natural, management-induced or stress-induced moult. The environment where poultry live, as well as their nutrition, rates of egg production, types of housing and equipment, disease and pecking behaviour affect feather condition and feather loss.

Flocks that have a large number of birds with poor feathering on the back, vent, tail, wings, head and neck are a sign that the flock is experiencing stress or experiencing a moult. Loss of feathers on the head, back, base of tail and vent areas usually indicate adverse feather pecking. Bare areas of skin are prime regions for attack and cannibalism by other birds especially if there is a scratch or wound in these areas. Ineffective beak tipping may contribute to the feather loss, as poorly tipped birds are able to firmly grab feathers or inflict damage using their sharp beaks. Severe feather pecking usually starts on the back or base of the tail.

3.2 Bird plumage

Feathers form the distinctive outer covering or plumage of birds. Birds have feathers for flight, to provide insulation from temperature extremes, to protect them from physical injury, repel water, provide camouflage from predators and to help attract others of the same species. Birds may also pluck their own feathers to line the nest to insulate the eggs during brooding and very young chicks. Feathers are replenished periodically during the bird's life.

The feathers come from well-defined tracts on the skin. There are three main types of feathers on a bird:

- **Flight** feathers occur at the top and back edges of the wing structure. They give the bird uplift and stability in flight.
- **Contour** feathers give shape or contour to the bird's body. The fluffy inner parts keep the bird warm, while the outer portions lie over one another to give the body a smooth shape.
- **Down** feathers are located around the vent and on the under-surface of the fowl. They keep both the bird warm and the eggs warm during brooding.

Plumage changes several times over a bird's lifecycle. Firstly when a chick hatches it is covered with down apart from some wing and tail feathers. The down is quickly replaced with feathers by four to five weeks of age. At eight to nine weeks the flight feathers are replaced and more feathers than usual will be noticed in the shed, in the cage or on manure belts. A third moult occurs at 13–15 weeks before sexual maturity and the new plumage is considered to be mature. A delay in the start of the third moult is a sign of poor growth and/or uneven flock weight uniformity. The times of plumage change may be stress points that initiate severe feather pecking.

Sitting hens will naturally pluck down feathers and this behaviour is often seen in young hens in the first four to six weeks of lay. Down and other feathers may be seen in and around nests or in cages. The fingers in artificial nest lining sometimes catch the down feathers plucking them as the hen rises to move off the nest.

Feathers can wear or abrade, break or can be pulled or fall out over time. Birds in the wild have a seasonal moult because of a decreasing natural light pattern. It takes three to four months for mature birds to recover full feathering after a moult. The hormones that support egg production inhibit moulting. Stress can induce a partial moult and feeding a diet that does not support egg production can be used to induce a moult. Abnormal numbers of feathers on the floor, in the cage or on manure belts could indicate a severe bout of feather pecking, or that a partial or full moult is taking place. Some birds will have a partial moult during the latter stages of lay resulting in bare areas on the body that predispose these birds to skin damage caused by pecking by other birds.

A partial moult may occur in hens older than 40 weeks particularly in non-cage systems. A change in shell colour and/or a fall in shell quality often occurs with this moult. The amount of feather loss in flocks after peak lay can be modulated by careful attention to the nutrient content in the diet, particularly fibre content and amino acid profile.

3.3 Feather damage

Feather damage from pecking should not be confused with damage from equipment. For example, feather damage on the bird's chest or neck can occur from rubbing on feed troughs that are poorly designed or set at an incorrect height. Likewise, loss of feathers on the chest can occur in caged birds when they rub against the cage front or feed trough. In addition feather loss on the neck of caged birds results from rubbing against door wires and wing feather damage from cage wires. Barn and free range birds may also experience feather loss from equipment such as feeders being placed at incorrect heights. Feather damage due to equipment can be quite varied in a flock and is influenced by the behaviour of birds. Some birds will move along a feed trough following the moving feed to get particular bits of mash.



Feather wear from cage feed trough.



Flight feather wear (70 weeks).



Head and neck wear from cage.



Neck wear from feather pecking.



Feather wear on wing and feather pecking on back (60 weeks). Feather regrowth on back.



Bare areas on abdomen are easily scratched.

Poor feather cover adversely affects poultry in various ways including increasing the risk of sunburn for outdoor birds and increased feed consumption due to reduced insulation which leads to higher energy requirements to maintain the bird's body temperature particularly in cold weather.

Ambient temperature and natural light intensity are higher in Australia than in the United Kingdom or European Union countries. The brighter light illuminates feathers and increases the risk of feather pecking.

Changes in pecking behaviour, squawking and increased flightiness of a flock are indicators of potential pecking problems. These behaviours are disruptive to the flock and may increase stress and fear levels which effect growth, egg production and wellbeing. Taking note of flightiness, pecking behaviour and feather condition should be part of daily checks on flocks. Being able to predict when a flock may be under abnormal levels of stress allows stock attendants to manage future adverse circumstances. Plumage condition and abnormal pecking behaviour scores may indicate the need for a more detailed investigation as to what may be affecting the flock.

Stock attendants need to be trained to observe and monitor flightiness, pecking behaviour (sound and movement), feather prevalence (on cage floor, on ground and/or manure belts), as well as feather condition of the birds during daily welfare checks.

The farm/unit supervisor or owner should also make a weekly check of each flock for these indicators (particularly at critical times) as a back up to the daily checks made by stock attendants. Critical times are placement of pullets in the laying facilities, before lay starts, during peak lay or other periods of stress such as hot weather, a disease incidence or parasite infestation (e.g. red mite).

If changes in pecking behaviour are observed it is good practice to undertake a score of feather condition and pecking behaviour to give an objective assessment of what is happening. If necessary, the beak profile can also be scored. In addition, apply the checklists: *Monitoring and managing chickens, pullets and hens to minimise feather pecking and cannibalism* (Appendix A) and *Questions for minimising feather pecking and cannibalism* (Appendix F).

From these assessments an informed decision can be made on the action required to manage the pecking incident.

3.4 Feather scoring

Feathering or plumage damage of individual birds can be assessed visually using a suitable scoring system. Several systems have been developed mainly for scoring in research situations. On-farm scoring needs to be simple and easy to apply. Scoring of the flock gives an indication of the plumage condition, feather pecking status, long-term effectiveness of beak tipping as well as feather damage due to equipment such as cages, feeders and drinkers or loss of feather cover due to a partial moult.

Regular monitoring of each flock throughout the rearing and laying periods will identify severe feather pecking and feather loss and enable early instigation of corrective action to reduce the risk of injuries and cannibalism. It will also indicate the effectiveness of the enterprise strategy to manage pecking and cannibalism.

It is best to score feather condition of pullets (particularly if purchased as started pullets) immediately before and after moving birds to the laying facilities. This will identify if the scoring in both facilities is at the same standard. If the scores are significantly different an investigation should be made into the scoring methods. Scoring at these times also gives a base line with which to compare the feather score if there is a significant pecking incident during lay.

An 'at risk' flock can exhibit feather damage as early as 17 weeks. On arrival from the rearing farm the feather score should be rated as good with no plumage damage.

If a flock reaches 40 weeks of age with good feathering, hens generally maintain relatively good plumage until depopulation unless there is an abnormal stressor such as hot weather or disease.

A simple on-farm three-point scale scoring system can be used to assess feather damage without handling birds housed on floor systems and can be done visually at a distance of approximately 2 metres from the bird. Caged birds may need to be removed from the cage and held for assessment. The head and neck area, the back and vent area and the flight feathers are each scored separately. A sample size of 50 birds will give an indication of the feather condition in the flock. Scoring more birds (100–200) will give a more accurate assessment if there is large variation in the flock's feather condition.

Feather scoring can be used as a tool to develop a stock attendant's skill in observing the feather condition of the flock during daily checks and result in earlier detection of feather pecking.

The three-point feather scoring system

Score	Condition	Plumage description	Flight feather condition
1	Good	Part of body with minor deterioration of feathers, otherwise good feathering with skin completely covered by feathers.	Intact flight feathers
2	Average	Part of body shows clear deterioration of feathers and/or with bare skin visible with an area less than 5 x 5 centimetres.	Broken or separated flight feathers
3	Poor	Part of body with heavily damaged feathers with no or small areas of skin covered with feathers. With bare skin area visible that is more than 5 x 5 centimetres.	Many flight feathers missing or broken

Adapted from AssureWel.



GOOD: Well feathered.



GOOD: Some feather wear.



AVERAGE.



POOR.

How to randomly select birds for feather and pecking behaviour scoring

The birds scored must be representative of the flock. The process for selecting a random representative sample of birds for feather scoring is as follows.

From cages

1. Select cages throughout the house (i.e. both ends of the house as well as the middle).
2. Select cages from top, middle, and lower tiers particularly if there is large variation in feather condition. The poorest feather condition is likely to occur in the upper two cage tiers due to higher light intensity.
3. Score one bird from each selected cage (if pecking is occurring in a cage most birds in the cage will exhibit signs of being feather pecked).
4. Assess each bird standing in a natural or normal position either in the cage, ensuring birds move within the cage or by removing the selected bird carefully from the cage.

From a litter and/or slatted floor shed

1. If there are several sheds with birds of the same age, randomly select one shed for sampling.
2. Select 10 different locations in the house and score five birds in each location.
3. Ensure that birds are scored from different locations such as litter area, slatted area, perches and various levels or tiers.
4. Stand 2 metres from the birds and visually assess the plumage cover of the head/neck and back/vent area and wings without handling the birds.
5. It is easier and preferable to score free range birds before they are let out on the range.
6. If birds are already ranging, scoring half the birds in the shed and the other half randomly on the range will give an indication of feather damage/condition.
7. Sample birds on the range from various locations (i.e. 5, 10, 20 and 30 metres from shed). This depends on the shed and range layout.
8. Be aware that hens may be seeking refuge in the nesting system or under perches or on the top perch depending on the type of perch used.

It is preferable to do the scoring after the hens have completed lay for the day.

Scoring pecking behaviour

High levels of feather pecking behaviour in a flock can result in feather loss or painful injury with the added risk of cannibalism. These disruptive behaviours can increase the general level of stress and fear among the birds and some may be prevented from accessing all the facilities such as nest boxes and pop-holes.

Assess pecking behaviour at each location where feather condition is scored. To score pecking behaviour listen to and observe the birds for one minute after they have settled down. Record the number of incidents of pecking observed in a minute as:

- social behaviour to establish 'peck order', (sometimes referred to as aggressive behaviour) e.g. pecking at other birds or feathers, chasing other birds or fighting, or
- severe pecking which includes pulling out feathers, pecking at combs, wounds or the vent area.

Both behaviours are often signalled by a loud vocalisation or squawk and cowering behaviour.

If birds are found with severe pecking wounds, they should be removed and killed humanely. Minor wounds should be treated with Stockholm tar to prevent further damage to the injured bird. The pecking bird should be identified and destroyed in a humane manner.

3.5 Flightiness

Flightiness is an indicator of flock behaviour and how accustomed birds are to humans. It also indicates how regularly and thoroughly stock attendants move through the shed in a way that does not disturb the birds. Stock attendants should move slowly, calmly and avoid large, loud movements such as clapping or shouting at birds. Flightiness may also be induced by factors such as a sudden change in the colour of workers' clothing, the number of workers/people in the pen, general loud noise, noisy equipment, predators and wild birds in sheds. The aim is for a stable, non-flighty flock.

Because they are more fearful and tense, flighty flocks will be startled by minor events, run to the end of the pen and are vulnerable to smothering. Since some strains are more prone to flightiness, choose a strain that does not have this trait.

Score for flightiness during daily checks or after walking through the shed and assessing feather condition, sounds and pecking behaviour. Scoring on the range is usually unnecessary, as the shed scoring will give adequate indication of the flock flightiness.

- **Calm.** In general, the birds appear undisturbed by your presence and may actively approach you.
- **Cautious.** The birds appear somewhat disturbed or concerned by your presence but do not appear overly alarmed.
- **Flighty.** The birds appear actively alarmed by your presence, will move away, and vocalise loudly. These birds may also take time to calm down again and may cause smothering in opposite areas of the shed.



Photo Lilly M.

SUMMARY

- There are three main types of feathers on a fowl: flight feathers, contour feathers and down feathers.
- Feather condition is an indication of a bird's wellbeing.
- Flocks that have a large number of birds with poor feathering on the back, vent, tail, wings and neck are a sign that the flock is experiencing an abnormal level of stress.
- Abnormal numbers of feathers on the shed or cage floor or on manure belts indicate either a severe bout of feather pecking or a partial moult is taking place.
- Feather damage from pecking should not be confused with feather damage from equipment.
- Changes in pecking behaviour, sounds and flightiness of a flock are indicators of potential pecking problems.
- Observing flightiness, flock noises, pecking behaviour and feather condition should all be part of daily checks on the flock.
- Feathering or plumage damage can be assessed visually using a suitable scoring system using birds that are representative of the flock.

REVIEW ACTIVITIES

1. What is the feather condition of these flocks on your farm? (Use a cross.)

a. Pullet flocks

Good	Average	Poor

b. Layer flocks under 40 weeks

Good	Average	Poor

c. Layer flocks over 40 weeks

Good	Average	Poor

2. How much of a problem is severe pecking on your farm? (Use a cross.)

None	Moderate	Severe

3. Which of these behaviours do you notice on your farm?

- Loud squawking
- Cowering behaviour
- Birds panic in cages or pack into a corner in barn sheds
- Birds are extremely quiet
- Calm behaviour

BEST PRACTICE

- Regularly monitor each flock throughout the rearing and laying periods to identify feather pecking and feather loss.
- Stock attendants need to observe and monitor flightiness, pecking behaviour (sound and movement), feather condition, and feathers on floor and or manure belts during daily welfare checks.
- Conduct oft-repeated welfare checks throughout the day, ensuring birds are used to stock attendants walking the sheds (avoid brightly coloured clothing) particularly for the initial weeks after the birds are placed in the shed.



Photo Australian Eggs.

USE OF MANAGEMENT STRATEGIES DURING BROODING, REARING AND LAYING AND USE OF LOW PECKING STRAINS WILL REDUCE THE NEED FOR A SECOND TRIM.

This chapter will help you to consider strategies that could be used to minimise feather pecking, the risk of cannibalism and reduce the need for a second trim.



Chapter 4

STRATEGIES TO CONTROL FEATHER PECKING AND CANNIBALISM

You should be able to:

- describe brooding and rearing strategies to reduce pecking problems
- outline nutrition strategies to minimise cannibalism
- describe the use of devices and deterrents to reduce pecking injuries
- describe good management practices that reduce pecking problems in poultry from incubation to end of lay.

4.1 Introduction

The underlying causes of severe pecking and its progression to aggressive and vent pecking in poultry has been researched worldwide for many years. While not yet fully understood, the knowledge gained from this research enables the development of strategies that will help to manage the stressors that the birds have to cope with, reduce the risks of a pecking event and improve the wellbeing of hens in modern production systems.

This handbook outlines factors known to increase stress on the bird, the risk of pecking and cannibalism together with beneficial strategies that can be implemented to manage the stressors. Checklists and work instructions are included in the appendices for farmers to use when implementing and monitoring a strategy best suited to their farm.

Any husbandry practice or environmental factor that induces stress in the bird can affect its pecking behaviour. How the bird copes with the stressor determines the welfare outcome for the flock.

The best wellbeing outcomes for pullets and hens can be achieved by adopting a strategy that contains components that assist in managing/reducing stressors thus preventing the occurrence of aggressive pecking.

The components of the strategy are:

a. **Primary prevention**

- Identify, implement and monitor on-farm strategies that apply good husbandry practices and provide an environment focused on minimising the risk of pecking and cannibalism.
- Use infrared beak treatment on day old chickens at the hatchery to reduce the risk of feather pecking and to reduce the bird's ability to cause injury when pecking.
- A successful prevention strategy will ensure that most flocks complete their life without a severe pecking incident.

b. **Second beak tipping**

On some farms a second tip using the hot blade method at 8 to 12 weeks will be required if the risk of a severe feather pecking incident has not been reduced by good husbandry practices and infrared treatment. Use the second tipping until:

- the husbandry practices on the farm are at a standard that will reduce the risk of severe feather pecking to an acceptable level
- the prescriptive infrared treatment applied is appropriate for the environment where the bird will spend its life.

c. **Pecking outbreak control**

If severe feather pecking occurs despite all the preventative measures being applied:

- detect pecking early and immediately implement known control practices.
- If these measures fail to halt or reduce the event, an emergency or rescue beak trimming with hot blade will be required to bring the incident under control. The trim must be implemented as soon as possible if it is to reduce cannibalism. This action requires veterinary or poultry husbandry expert approval. Another option is to cull the flock based on economic and welfare considerations.
- Many pecking occurrences are able to be managed and do not require a rescue or emergency trim.

d. **Small hatchery hot blade trimming**

If it is not economically viable for a small hatchery to lease an infrared beak treatment machine, chickens can be beak tipped using hot blade trimming. This is done at the hatchery at day old or on-farm at five to 10 days of age.

- A 'tidy-up' or second trim is usually needed at 10–14 weeks to correct any beaks not trimmed correctly by hot blade at day old or five to 10 days of age.
- If more than 10 per cent of beaks require correction, review the first trim procedure and quality of trim applied.

There are numerous factors that can act as stressors and lead to feather pecking and cannibalism in pullets and hens. It may be one or several stressors that trigger the event. Any factor that will upset the bird's routine or environment can induce a severe pecking occurrence. Some of the critical factors are:

- using strains or breeds with a history of feather pecking and aggression
- poor bird health
- poor stockmanship, untrained staff and staff changes
- nutritional factors such as protein deficiency, mineral imbalance and insufficient dietary fibre
- form of diet or sudden diet changes
- incorrect feeding and drinking space
- high stocking density
- light intensity, uneven light and abrupt shifts in light intensity from shed to verandah/range
- poor litter quality or floor substrate
- lack of environmental enrichment
- rough handling of stock
- inadequate ventilation and temperature control
- poor ventilation (high dust and ammonia levels)
- variable weather conditions
- high noise levels
- presence of predators
- flies and ectoparasites
- placing birds of different ages together and relocation of hens to different cages
- sudden changes in clothing colour of staff.

The harsher climatic conditions and higher natural light intensity compared to Europe increase the difficulty in managing feather pecking and cannibalism in Australia. On occasions a flock in one shed of a farm can have an outbreak of feather pecking and cannibalism yet the same strain in another shed will not be affected. Such situations contribute to the difficulties farm managers have in controlling a vice or antisocial behaviour that may occur for no apparent reason. Anecdotally severe feather pecking can occur more frequently in free range flocks than in caged or barn flocks (usually in every fourth or fifth flock).

All poultry peck at feathers and cannibalism can occur in a wide variety of birds of different genetic backgrounds. Cannibalism in poultry involves severe pecking and tearing of the skin and usually leads to death of the pecked bird if it is left in the flock. Once cannibalism has started, it can spread very rapidly through a flock causing large losses of birds, welfare concerns and economic loss. Cannibalism can occur at any age or in any strain and occurs in birds raised and housed in free range, barn, aviary and cage production systems. Increasing community and market expectations for improved animal welfare standards, together with farmers concern for poor bird welfare arising from pecking, has raised the need to address the cannibalism problem.

Cannibalism can be a huge impost on the economic viability of a farm. The costs associated with cannibalism are significant in barn and free range systems. In most modern cage systems mortality attributable to cannibalism and oviduct infections is as low as 1–2 per cent. Mortality from cannibalism in some strains can be greater than 20 per cent depending on the production system and management strategies.

For many years the standard method used to prevent cannibalism was hot blade beak trimming. In developed countries this method is gradually being replaced by infrared beak treatment. Beak tipping, particularly hot blade is coming under increased scrutiny in Australia and overseas. It is good husbandry practice to apply methods for controlling feather pecking and cannibalism in conjunction with beak treatment and thus reduce the need for a second trim.

The methods described in the following pages should be discussed with your supplier of commercial laying birds as well as nutrition, housing and husbandry experts. The methods include strategies that can be implemented at various stages of the life cycle of a laying bird.

4.2 Incubation, brooding and rearing strategies

Incubation

If the parent stock of commercial layers and nucleus breeder flocks are experiencing stress during lay, their offspring are likely to be more fearful and feather pecking might be one of the consequences. This should be discussed with the hatchery and breeder farm before you take delivery of your flock.

Eggs hatched from older breeder flocks and poor quality eggs may result in variable chick quality, with an increased risk of pecking occurring.

Once eggs are laid, factors such as the amount of light received during incubation may be important. Chicks hatched from eggs that received light in the last stage of incubation may be accustomed to higher light intensity exposure after hatch and they could perform gentler feather pecking. Further research is required to establish the role of light during incubation on feather pecking after hatch.

Brooding

Cannibalism can be reduced if chicks are given the opportunity to rest and sleep when housed in sheds that have whole room floor brooding, cage brooding or in sheds with spot brooding. The darker areas under spot brooders help to synchronise flock behaviour and reduce the risk of active chicks pecking the resting chicks.

In whole room brooding on the floor or in cages, light intensity needs to be maintained at 5 lux to prevent the birds pecking at each other. Overcrowding in the brooding areas in any of the rearing systems can result in cannibalism.

Use low light intensity when brooding to reduce the risk of pecking.

Rearing

Housing environment and rearing management are important factors in the development of feather pecking which is usually higher in laying or breeder flocks if they were already pecking during rearing, especially during the last stage. Up to 80 per cent of feather pecking that occurs during lay can be attributed to the environment and management of birds during the last stage of rearing.

Cannibalism will be higher during lay if pullets are moved into a laying environment that is different to the rearing facility. Birds that are housed in similar facilities from day old to end of lay usually have lower pecking mortalities, especially on free range farms. Birds reared on perches tend to peck less at other birds depending on how the perches are located in the shed. However, birds will peck at other birds on nearby perches if they can reach these birds. Pullets that did not engage in pecking during rear are less likely to peck during lay. However if birds are exposed to higher light intensity or abrupt shifts in intensity in a free range facility, pecking may occur.

It is usual practice that cage reared pullets are not provided with perches during rearing, particularly if the birds are to be housed in layer cages which are not enriched with perches.

Most pullet flocks with severe pecking in rearing continue this behaviour for life.

Rearing management

Rearing pullets with good feather cover is critical if farmers are to minimise the risk of pecking. The actual body weights of birds being reared should closely match the breeder company's recommended target weights. It is important to monitor body weight regularly by weighing a sample of pullets. Birds with an increased feed intake and body weight above the breed standards are at a higher risk of plumage damage. The use of chain feeders, the presence of high levels of carbon dioxide and ammonia, and noise are other factors that can result in an early onset of feather damage.

Litter

Early rearing experience that stimulates ground pecking and dust bathing of chickens can modify feather pecking behaviour of laying hens. The quality and quantity of litter available during the first four weeks of life influences this effect.

Common litter materials are wood shavings, chopped straw, sawdust, shredded paper and rice hulls. Litter should be light, friable, non-compressible, absorbent, quick to dry and have low thermal conductivity. The litter quality in a shed is affected by the type of diet, the temperature humidity and ventilation rate as well as the drinking space and management of the drinkers. Pecking is induced when levels of ammonia are high enough to be smelt by stock attendants.

The recommended depth for litter in non-cage brooding and pullet rearing is 5–10 centimetres. Sawdust can result in high dust levels and respiratory problems. Dust particles in the litter which are capable of causing health problems in the birds are derived from dried faeces, feathers, skin and litter. These adverse effects arise because they carry or incorporate bacteria, fungi and gases.



Laying stock require sufficient substrate for hens to carry out regular comfort behaviours such as resting, sleeping, preening, scratching and dust bathing. Research is required to establish the minimum depth of substrate required to enable hens to carry out these behaviours.

Early experience with litter that stimulates ground pecking reduces pecking.

Body weight uniformity

Ideally newly hatched chicks should be segregated by donor (breeder) flock because hatch weight is affected by the age of the donors. These batches of chicks can then be managed appropriately to achieve desired uniformity. In some rearing systems particularly with large batch sizes this is impractical. Industry reports that by applying good husbandry practices during brooding (particularly temperature control), pullets at six weeks have overcome these weight differences and achieve good uniformity at 16 weeks.

A pullet or layer flock that has a large variation in body weight lacks uniformity. Uniformity is the measure of the number of birds whose weight falls within plus or minus 10 per cent of the flock average. This should be at least 80 per cent and preferably 90 per cent. The aim is to have a tighter body weight range as the lighter and heavier pullets cause problems during lay. A 15 per cent reduction in body weight below the breeder standard at point of lay is associated with a three-fold increase in the incidence of cloacal haemorrhage and in the underweight birds about 10 per cent of birds can have severe chronic cloacal damage which attracts pecking by other birds.



Adapt birds to the environment

If the birds are flighty then the likelihood of feather pecking is increased. Help birds adapt to their environment by early training. Attendants walking through the shed and operating equipment regularly from when birds are placed in the shed helps birds to assimilate to people and noise.

Socialise the birds

Pullets that have had regular contact with humans are less stressed and fearful. Staff should frequently walk through the shed (at least four times per day) for the first two weeks in the rearing period so that birds get used to the staff caring for them. Space out the walk throughs so that the pullets have time to relax between them.

Pullet transport and housing

When birds are transferred from the pullet rearing facility they are loaded into crates and transported by truck to the laying house. This procedure causes significant stress to birds and can result in the development of feather pecking. Carry out handling and crating of birds according to the Australian Animal Welfare Standards and Guidelines Land Transport of Livestock (2012) (Transport Code) to minimise the potential stress on birds.

Transporting pullets at night keeps the birds calm, avoids summer heat stress and is the least disruptive to the birds. Before their arrival increase the depth of feed and water in troughs and water pressure to encourage the formation of drops on the tips of drinker nipples. This will help the birds find feed and water more easily after placement in the layer facility. During the last welfare checks on the day of delivery, check that all birds have found the feed and water, particularly where it is not on all floor levels. Birds that have not been drinking or eating should be placed near the drinkers and feeders.

4.3 Nutrition strategies

Fibre

An adequate amount of insoluble fibre in the diet is important for minimising the risk of an outbreak of cannibalism in chickens during rearing and lay. Providing additional fibre in the pen or in the diet is not a cure for cannibalism but does reduce the likelihood of it occurring. Additional fibre reduces the fowls' desire to peck at feathers presumably to obtain fibre from feathers.

It has been suggested that the physical properties of fibre change the function of the gizzard and the intestine, giving the birds a calm feeling. A diet low in energy and high in non-starch polysaccharides (NSP) improves the bird's digestive system. They spend more time feeding, feel less hungry and have reduced levels of feather pecking. Research suggests a minimum of 4 per cent crude fibre is required for layer diets. Anecdotal reports suggest that 3.5 per cent crude fibre in high density pullet and layer diets can be achieved both practically and economically with improved gut health, lower mortality at end of lay, increased egg production and persistence of lay and better feather condition of pullets and layers with less feather pecking occurrences. Care must be taken to ensure the amino acid requirements are met.

Millrun, oat hulls, rice hulls and lucerne meal are the traditional sources of fibre. New sources of fibre are available in products such as Opticel and Arbocel which are manufactured from tree fibres. They can be added to diets to increase the fibre level as they have a crude fibre content of 50–70 per cent.

Insoluble fibre in the diet minimises the risk of cannibalism outbreaks.

Low protein diets

Cannibalism and feather pecking have been found to occur when low protein diets or protein deficient diets are fed to commercial layer strains. Deficient levels of sulphur-containing amino acids (methionine and cysteine) and tryptophan and arginine also result in increased pecking mortality. Including methionine in drinking water (1.5 g/litre for the first four days, 1.0 g/litre for next three days) can reduce feather pecking.

Rations containing a high level of wheat, with a low protein content and low vitamin B12 result in a protein deficiency. Birds compensate for the deficiency by increasing their pecking at the feathers of other birds. Increasing the proportion of plant proteins (canola meal, soybean) without adjusting protein or amino acid levels has also been associated with increased pecking mortality.

Low protein diets or protein deficient diets can result in cannibalism.

Vitamins and minerals

Diets that are deficient in calcium, or magnesium sulphate, or zinc or salt can increase levels of pecking. Feeding vitamin preparations or including vitamin B complex in drinking water can help reduce feather pecking. Reduced dietary electrolytes, particularly sodium can significantly increase pecking mortality.

Mineral and vitamin deficiencies can increase levels of pecking.

Change in diet

Changes in diet (e.g. change in source of feed ingredient or change in formulation or ingredient) from one delivery to the next can lead to a change in palatability and feed intake resulting in increased pecking incidence and mortality.

It is critical to match the bird's changes in nutritional requirements through the laying period to the nutrient density of the feed. For example, egg weight above the standard recommended by the breeder can be stressful to the hen while she is producing the larger eggs. In this case the nutrient specifications for the diet should be changed. If this is not done feather pecking and cannibalism may occur.

Where there are changes in ingredients or significant changes in diet specifications make these gradually; preferably over a two to four week period. It is good practice to blend the previous diet with the new diet to help the birds gradually adjust to it.

Provision of straw, grass bundles, vegetable leaves and whole grain

Scratch grain, straw bales, green leafy vegetables, grass clippings and hanging bundles of grass from the ceiling has been used to encourage foraging by birds rather than pecking at other birds especially in barn systems.

Form of feed

Feeding mash reduces feather pecking compared to feeding pellets or crumbles. Birds take longer to consume mash giving them less time to engage in feather pecking.

4.4 Strain of birds

Genetic variation between strains and breeds can impact on pecking mortality. Because there are differences in feather pecking and mortality between strains, there is the potential to select stock that do not require beak tipping. Cannibalistic deaths occur less frequently in birds selected on family performance without beak tipping, compared to unselected stock.

Farmers have observed differences between strains and will often change to another that engages in less pecking and cannibalism. New strains of birds are constantly being introduced into the market. Farm managers should communicate with bird suppliers to obtain the latest information on strains with low levels of cannibalism.

Use strains that engage in less pecking and cannibalism.

4.5 On-farm factors that can lead to cannibalism

- Flock nervousness or hysteria, which can cause pecking in the flock, is common in high producing strains.
- Pecking occurrence corresponds with, or is accentuated at, periods of high metabolic pressure i.e. peak egg production and peak egg mass.
- Disturbance from vehicles and other farm noises can upset birds and increase pecking.
- Changes in staff tending to the flock can disturb birds and initiate pecking. Likewise staff who are not trained in basic husbandry skills can lead to high stress levels in birds.
- Pecking increases with a lack, or absence, of properly designed nest boxes and overuse of some nest boxes.
- Rough handling often leads to pecking.
- Lamé, ill, unthrifty or dead birds left in the flock attract the attention of other birds who peck at them.
- High dust and ammonia levels, poor ventilation, presence of predators, flies and ectoparasites can increase pecking.
- Variable weather conditions (e.g. high humidity and high temperature) especially during thunderstorms and lightning activity can initiate pecking.

Open-sided housing

The effects on poultry housed in open-sided sheds because of reduced control over temperature and light period and intensity are as follows:

- It is harder to achieve genetic potential performance and behaviour if birds are subject to a wide variation in temperature, light period and intensity.
- There is more environmental stress on the birds and an increased likelihood of severe pecking behaviour.
- During the rearing period highly variable environmental conditions make it difficult to maintain pullet target weights and uniformity because the body maintenance requirement is 10–15 per cent higher.
- During the laying period variable environmental conditions can result in poorer laying performance. High temperature (and humidity greater than 75 per cent) can affect bird comfort and reduce feed consumption. Temperatures above 30°C are not well tolerated by layers.

- Low temperatures (less than 16°C) can result in excessive feed consumption and poor feed conversion to eggs. It is often difficult to estimate and match the flocks' feed consumption to the nutrient density of the diet.
- Daylight cannot be prevented from entering open-sided rearing sheds and chickens hatched during months of longer daylight will grow faster, and come into lay earlier which impacts performance in the latter stages of lay. Pullets will become stressed following transfer if the light period during laying is not the same as during rearing.
- Birds are more likely to peck at feathers and vents when exposed to higher light intensity because the brighter light makes feathers, bare skin and skin more visible.
- Pullets (including their beaks) tend to grow faster when there is poor control over the light period and intensity especially in free range systems.

4.6 Management strategies

Removal of pecking instigators and pecked birds

Removing birds observed to be instigating pecking is recommended. This must be done when it is first observed as it can be socially transmitted with many birds eventually participating in severe pecking.

In floor flocks it is difficult to find the birds who are pecking. Culling the injured or severely pecked birds as soon as they are observed will help in controlling the incident. If left in the flock, these birds will vocalise, squawk, cower or jump and this disruptive behaviour encourages the offenders to continue pecking as well attracting more birds to join in.

Use of the range

Feather pecking is reduced in free range laying hens when they use the range more. Hens will use the range more if it is enhanced with shelterbelts, crop rotations, shade and sand baths. Range areas that are only fenced open fields with hardly any cover do not stimulate the birds to use them nor do they allow hens the opportunity to seek shelter from weather or predators.

The risk of feather pecking is reduced when the range has trees and man-made shade structures as these provide an area where birds can dust bathe, seek shade and protection from predators.



Hens in the range usually remain close to the poultry house and denude this area of forage. However, when trees or shrubs or shaded areas are provided, about 80 per cent of hens in larger flocks will use the range—and use it more extensively. Birds will venture out further along fence lines and temporary guidance fences can be used to encourage birds to use more of the run.

More birds use the range area when it is cloudy.

Feather pecking is reduced when birds use the range more.

Lighting

Limited work has been done on the basic science of the vision in birds, especially ultraviolet (UV) sensitivity. Inappropriate lighting such as low light intensities or flickering has negative consequences for bird welfare. The effects of access to daylight have not been widely studied, but some studies indicate that pullets for free range egg production should be reared with access to natural light in order to avoid negative health and welfare consequences.

Traditional incandescent and halogen bulbs have been phased out in the European Union as part of an effort to save energy and fight climate change. Recent experiments compared the effects of different light sources (incandescent bulbs, high frequency daylight tubes, blue fluorescent tubes) and light intensities on bird welfare. Feather pecking, activity and aggression were more frequent under high light intensity. Light emitting diodes (LED) are promoted as an alternative, however we know very little about the impact of the various selections of wavelengths used in the LED technique; how the light distribution works in the environment of a hen house; and how the hens will respond physiologically and behaviourally to this light source. Further research is required to ensure that the introduction of these new techniques does not impair bird welfare.

Take care when adjusting light periods so that birds are not unintentionally exposed to increasing or decreasing day length.

Light intensity

Poultry originated in rainforests under a foliage canopy with low light intensity. Brighter light increases pecking activity in birds. Light can be manipulated in poultry houses to reduce pecking amongst the flock.

Light intensity has these effects on poultry behaviour:

- Poultry peck more often under higher intensities of 100–1000 lux.
- Hens exhibit an increase in severe, aggressive, vent and stereotypic behaviour when exposed to higher light intensity.
- Head flicking, vent, tail, head and body pecking are the behaviours most closely associated with an increase in light intensity.
- Higher light intensity tends to increase the nervousness of the hens and results in pecking and feather loss.

For the purposes of this handbook, high light intensity is considered to be above 20 lux and low light intensity below 2 lux (twilight is about 10 lux and 1000 lux on an overcast day in Australia). The optimum range in controlled environment sheds for pullets is 3–5 lux and 5–10 lux for layers. In open-sided sheds where birds are exposed to natural light during rearing or lay maintain a light intensity of 10–15 lux from four to six weeks through to 14 weeks of age. To reduce the risk of pecking increase light to the daylight levels birds will experience in the shed during lay.

When birds are being inspected the light level needs to be increased so the stock attendant can see more clearly and identify any problems with the birds. It is important to return the light levels back to normal immediately afterwards.

Under controlled lighting of low intensity (about 3–5 lux) it is possible that birds cannot see each other well, reducing antagonistic encounters and damaging pecking behaviour. It is suggested that light levels of 5 lux are used initially during the first three weeks of rearing and if pecking is a problem then the level is gradually reduced to a minimum of 3 lux. Do not go below 3 lux as continuous low light levels from day old are likely to hinder development of the eyes.

High light intensity and abrupt shifts in intensity can increase the incidence of pecking.

To avoid any pecking, the controlled environment shed needs to be made lightproof to avoid outside light leaking in through the shutters or fans. This is not possible in open-sided or naturally ventilated sheds so other techniques have to be used to minimise the effect of light, particularly bright light on the birds.

Using a higher light intensity in nest boxes to attract birds to the nest can increase pecking mortality because birds can easily see the oviduct everting as the egg is being laid. The entrance to the nest should be well lit but the interior should be darkened.

In naturally ventilated sheds the lower side panels of the sheds are often left open for ventilation. Excessive light shining up under the cages illuminates the vent as the egg is being laid, encouraging other birds to peck. In naturally ventilated barns it is important to eliminate areas where bright sunlight strikes the floor. Changes in light levels in naturally ventilated sheds caused by frequent changes in outside cloud cover can increase pecking. Abrupt shifts in light intensity are a major trigger for severe feather pecking and cannibalism.

Increasing light intensity and length of the light period for laying birds can heighten pecking risk.

More pecking also occurs with variable light intensity from poor lighting layout in controlled environment sheds. Lighting should be positioned so that it produces an even effect in the shed. Bright spots or areas of shadow can result in injurious pecking. In addition light leakage from inlets and outlets can give ‘torch-like’ beams of light on birds’ feathers and this attracts feather pecking.

Flock uniformity

Poor uniformity in body weight (either too light or too heavy) at point of lay increases the risk of greater pecking mortality during early lay. Pullet flocks with poor uniformity should be graded into at least two, or more, even groups with management and diet adjusted to help the birds reach the desired weight and uniformity standard.

Onset of lay occurring earlier than the breed standard can be a pecking risk factor especially in smaller pullets, as they are more prone to cloacal exposure.

Poor uniformity in body weight can increase pecking.

Stocking density

The relevant welfare codes, standards or guidelines and breeder companies recommend stocking densities for cages, barn sheds and free range systems which if exceeded will usually cause pecking problems especially during the first four weeks of rearing. Once the behaviour is acquired the birds will continue pecking into the laying period. One of the benefits of free range systems is that stocking density inside the house is reduced while birds access and use the range.

High stocking rate usually causes pecking problems.

House design and equipment layout

Stocking density may also have different effects depending on the housing system. Increasing the stocking density above 550 square centimetres per bird in conventional cages results in increased mortality but the relationship between higher stocking density and mortality in alternative systems is more complex. When layer flocks are first placed in barn or free range houses there can be feather pecking and aggression if there are seven to nine birds or more per square metre. However, only in flocks with 12 or more birds per square metre do these behaviours continue and increase with age.

Poor positioning of feeders, drinkers, nest boxes and perches will create stress in the flock, which could lead to feather pecking.

Group size

When birds are housed in large groups whether in cages, barn, aviary or free range a higher percentage of the group is cannibalised than in small groups. More research is needed to get a clear view on the effect of group sizes and effects of stocking density both indoors and outdoors.

Relocation of pullets and hens

If birds are moved from controlled light housing to uncontrolled lighting they are prone to pecking problems within two to four days of the move especially during the pre-lay period when there is competition for feeding space and/or inadequate feed intake.

Birds moved from controlled light housing to uncontrolled lighting are prone to pecking problems.

A common practice is to move hens to maintain similar numbers in each cage to fill gaps where birds are missing. A hen that survives in the cage after a pecking bout could be the killer hen and could peck at her new cage mates.

Reduced or damaged plumage either from cage rearing or during lay can lead to increased pecking mortality. Broken, distorted or cut feathers are more attractive to flock mates.

Range access after placement in laying facilities

Ideally birds housed in the same facilities for rearing and laying should not be given access to the range from 16 weeks of age until after peak egg production, while birds housed in different facilities for rearing and lay should not have access to the range until after peak egg mass to minimise the risk of vent pecking.

However, labelling and quality assurance requirements introduced in 2017 mean that pullets need to be given access to the range earlier otherwise their eggs are classed as barn laid.

Anecdotally, farms are successfully managing this requirement by giving pullets use of the verandah (if present), or else the range at 18–20 weeks. Pullets with access to a verandah are then given entry to the range a week later. The success of this practice depends on rearing uniform pullets and managing the other risk factors that may induce pecking during the prelay and prepeak lay period.

Nesting management

Managing nest boxes well will encourage birds to use the nests and not lay floor eggs. Floor eggs can encourage birds to group together leading to smothering, stress, injuries and feather pecking in the flock.

The use of nest boxes can be encouraged by exposing birds to perches during rearing, and managing husbandry and environmental conditions at the onset of lay and during lay.

Hens can become frustrated and peck other birds if they can't reach the nests, particularly if they have to move through areas filled with feeders, drinkers and perches and if blocked by other birds parading or grouping in front of the nests.

There should be an even light throughout the shed and light beams shining directly into nests should be avoided. Bright spots or areas of shadow can result in injurious pecking.

Well-designed, well-sited nest facilities are more likely to be used by the hens. Nests should be sited in the coolest, darkest and least draughty areas of the shed. Avoid competition by having more nesting area. Suitable stepping rails from the floor, to slats, to the nests makes it easier for the hens to get to the boxes. There should be enough light so the nest entrances are clearly visible to the birds and just enough light in the boxes for birds to see, although initial higher light levels inside the nesting area may improve nest acceptance by pullets coming into lay.

Depending on the strain of bird and lighting program (day length) some birds will lay before the shed lights come on, increasing the probability of laying on the floor. Switching nest nightlights on two to three hours before the main shed lights turn on will encourage birds to use the nests.

Floor egg laying can be discouraged by using electric fencing judiciously, creating draughts with fans in problem areas, adding more light in dark areas with LED strip lighting or by positioning feeders and drinkers so they do not create areas attractive to nest in. Collect floor eggs frequently and quickly with minimal disturbance to the birds. Only carry out essential tasks during the main laying period.

If nests are available 10–14 days before the onset of lay, pullets will become used to them and will be more likely to lay in boxes rather than laying floor eggs.





Enrichment devices

Environmental enrichment makes both the outdoor and indoor environment more interesting for the bird and increases the range of desirable behaviours and reduces the occurrence of harmful behaviours, such as feather pecking. The enrichment devices improve the interest range of the birds and enable them to cope better. This is normally achieved by adding objects such as, biological materials (e.g. grasses, seed pods, hay bales), furniture (e.g. perches and litter material), pictures, sounds and odours into cages or floor pens. The use of furniture in enriched cages (e.g. nest boxes, perches and dust bathing areas) also helps to satisfy some of the birds' behavioural and physiological requirements.

Enrichment devices are best introduced during pullet rearing. Birds are more likely to find devices introduced in rearing non-threatening and will adapt to using them faster than if enrichment is introduced during the lay cycle. The less change in the environment and equipment between rearing and laying the more the flock is helped as stress is reduced following transfer to the laying facilities.

It is beneficial to introduce new pecking objects (blocks, stones, hay, bits of polypropylene twine, etc.) at intervals and at different locations during the flock's life. This maintains the birds interest and reduces the risk of severe pecking. There are indications that hens use enrichments less after peak lay.

A wide range of devices have been used to provide enrichment for chickens. Some birds ignore them and remain aggressive. The 'Agrotoy', which consisted of a blue plastic frame with a red hanger attached, claimed to reduce aggression and mortality in caged laying hens. It was found to be ineffective and not practical to use. Other devices that have been researched but not applied in practice are small silver bells to attract pecking. 'Peckablocks' (a cereal-based enrichment device available for small birds like canaries), was also said to reduce the amount of feather pecking behaviour directed at other birds but has not been used in commercial practice. They may be useful for small farms which want to overcome pecking issues in their flocks.



Photo courtesy of Donnalee Taylor.

Polypropylene twine

Chicks, pullets and adult laying hens will also peck at bunches of white polypropylene twine secured to the roof of the cage or a perch. Birds tease apart the strands of the string similar to preening. The string reduces both gentle and severe pecking and decreases the amount of damage from feather pecking. The string used is very resilient and cannot be consumed by birds, but it is important the string is securely attached to prevent it dislodging and wrapping around the birds' legs. White and yellow string enrichments are more attractive to poultry than blue or orange string and chains or beads.

Enrichment devices reduce pecking problems in birds.

Pecking blocks and pebble stones

Pecking blocks and pebble stones are recent innovations in Europe for occupying barn and free range birds. They are an enrichment device with the potential to wear or blunt the beak. Research by Bristol University in the United Kingdom has found that pecking blocks are one of the more effective means to lessen birds pecking each other.

Using aerated breeze blocks (an insulating type of building brick) as pecking blocks was found to be one of the more effective means of reducing the amount of pecking in a flock. However, it was possible that fly ash, the main ingredient of the blocks, may contain dioxins. In further research the ingredients for making a block free of dioxins and heavy metals was developed, then tested and found to be effective in reducing pecking. Licences are available to further develop the block and market it.

The pebble stones (a variation of pebble blocks) used in Europe are 5–10 kilograms in size and are made from ground construction material waste held together with a binding agent. There are different levels of hardness. Field observations suggest there is no objectively measurable change in the beak of birds with access to the pebble stones, however, on running a finger over the beak tip it feels less sharp. The stones are useful for occupying the birds and are more likely to be used if they have use of the stones during rearing. There are also concerns about the stones containing dioxins. Research is needed to eliminate any contaminants and show the possible benefits.



To be effective in mitigating feather pecking in a flock, a pecking block or pebble stone needs to be attractive enough for the birds to peck at it, prolong their activity, keep them occupied and reward their foraging and pecking behaviour. It must have the potential to cause some abrading of the beak. The block must not wear away too quickly but have the strength, durability and friability so that birds are able to gradually break it down. It should contain non-toxic ingredients and must not be affected by rain if placed outside in runs.

Blocks or stones should be placed where they will not become soiled, knocked over or covered with litter. It is best practice to suspend them above the ground or floor at an accessible height.

Anecdotal evidence suggests that flocks with good foraging opportunities use pecking blocks less than those with fewer opportunities.

A variety of pecking blocks or stones based on maize, flint, grit or calcium or oyster shell grit, other grains and grit are available in Europe and Australia. They may include other minerals and are manufactured in different degrees of hardness and are designed to supplement the birds' diet. However care should be taken to ensure that the added supplements do not upset the nutrient balance of the diet.

4.7 Beak and claw abrasives

Beak abrasives

Abrasives are used to wear away the sharp point of the beak. The technique involves fixing an abrasive material (similar to sandpaper or abrasive paint) in the base of the feed trough or to some equipment. It can be used with automatic feeders (robotic) that deliver feed as they pass along the trough but is not practical for chain feeders. While the birds are feeding they wear down the sharp hooks on their beaks. This technique may be suitable for birds destined for cage egg production or alternative systems (including organic). Use of beak abrasives has been promoted in some European Union countries but has not been applied widely in the commercial poultry industry. Chain feeders abrade the bottom beak and this abrasion needs to be considered when applying beak treatment.

The beak abrading technique can be used when rearing pullets from six to 18 weeks of age onwards into the laying period as required. The early introduction of this technique could trim the hooked beak that some birds develop late in the rearing period.

If hens reach point of lay with a tipped beak, the beak may remain that way throughout the whole laying cycle. The abrading technique can be used anytime throughout the laying period. It can be used if the birds reach point of lay with hooked beaks, or if the beak regrows during the laying period.

Beak abrasives are effective during rearing in light controlled sheds when the birds are on a controlled feeding regime, and levels of food in the troughs are low.

Fixing an abrasive material in the feed trough can abrade the hook on the beak.

Claw abrasives

The claws of most bird species are used as weapons to inflict injury on competitors and are used to maintain status in the social hierarchy. They are one of the most effective defensive structures, causing stress and altering behaviour patterns in other birds of the flock.

One of the criticisms of keeping hens in cages is the length that claws can reach by the end of the laying period. This has been recognised in the European Union with the European Communities Council directive that states that ‘cages shall be fitted with suitable claw shortening devices’. Hens in cages are not able to wear down their claws as effectively as birds in free range or other non-cage systems.

Floor layers spend a great deal of their time foraging. This behaviour involves persistent scratching at the litter or soil looking for edible items. The scratching behaviour wears down or abrades the claws and keeps them blunt. In cages, however, the claw length of the middle toe can reach over 3 centimetres and in some strains can become twisted and cracked.

During the pullet rearing stage, claws can become sharp and to avoid lacerations handlers need to wear a hat, protective glasses and gloves, long trousers, long sleeved shirts or overalls. In recent years commercial breeding companies have selected to reduce the likelihood of birds having both long and/or sharp claws. However, the claws of pullets reared on soft litter still become sharp and will inflict injury on other birds and handlers. Breeders will spar and cause injuries to other males and females in the flock.

When birds are placed in layer cages at 16–18 weeks the middle claw length of current strains of birds reared on the floor is about 18 millimetres.



During the laying period the claws of birds can cause abrasions to other birds, especially during periods of disturbance. For example, when cage birds are being fed, they will clamber over each other in an attempt to get to the feed trough, causing abrasion to other birds especially if the claws are sharp. This risk is reduced where birds are housed at the standards in the current relevant welfare codes, standards or guidelines. Likewise, there is potential for injury to birds from claws during other periods of disturbance such as when all birds in a shed have a hysteria attack.

Birds can become flighty while eggs are being collected, during routine cleaning and maintenance of the shed, when the egg belt and manure belt are being run, when unfamiliar staff enter the shed, and when loud noises or unusual events occur.

During some of these disturbances birds attempt to escape from the cage and can cause injuries to other birds and to themselves. It is not uncommon for the claw of a bird to get caught on its own wing. Even short claws can be sharp and be a potential source of injury to other birds.

When a bird is injured by claws there is the potential for cannibalism to develop, especially if there are blood stains, broken skin, raw wounds or an injured vent. If one bird pecks at an abrasion other birds are attracted to join in and the pecked bird usually dies. If the wound occurs around the lower abdominal region where the skin is very thin, death of the bird occurs rapidly.

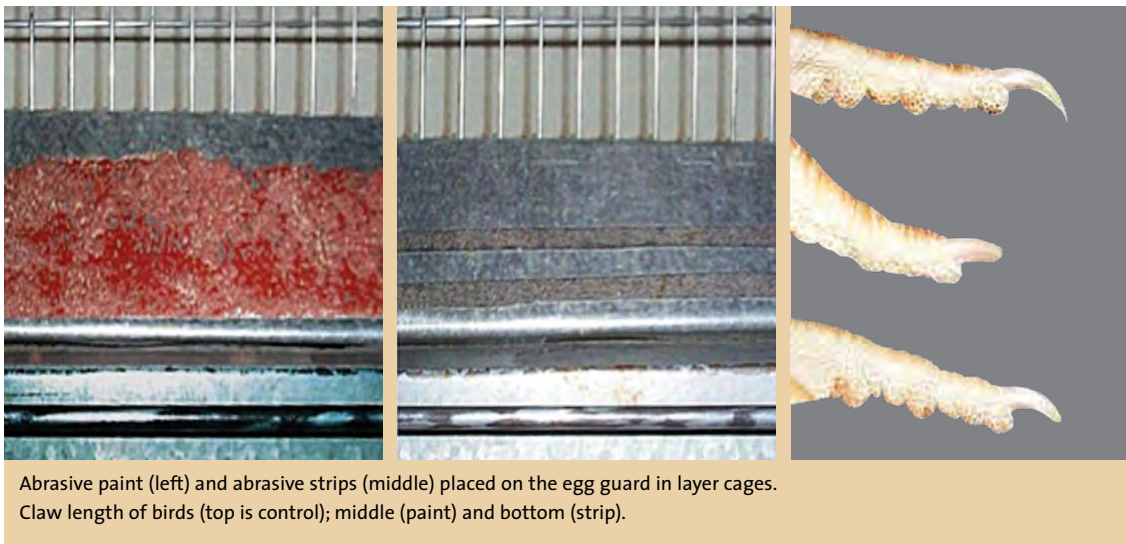
Long claws also cause accidents if they get caught in the cage structure. The problem areas occur mainly in the corner of cages and around the feed trough. When birds get trapped other birds will peck and step on them, which could result in an injury leading to cannibalism. Birds that are trapped for extended periods will die.

In Sweden, Dr Ragnar Tauson developed a cheap method to keep the claws of caged layer hens short and blunt by fitting strips of abrasive tape onto the egg baffle. Since then other abrasives have been included in modern cages including a perforated baffle produced during cage manufacture; sand stuck to the baffle with glue; and metal plate with iron filings and abrasive stone.

The only effective place to fit the abrasive is onto the egg baffle when the feed trough is located outside the cage. Claw abraders should be applied well up the baffle plate near the feed trough and extended for most of the width of the cage. Farmers installing new cages should ensure that a perforated egg baffle is fitted. Where cages are not fitted with a perforated baffle, abrasive tape or abrasive paint can be applied to the baffle.

Abrasive tape

Abrasive tape can be easily cut into different sizes and fitted onto the egg baffle in both new and old cages. Birds' claws scrape against this tape while they are feeding. This blunts the claws and reduces the effectiveness of the claws to cause injury and feather loss and reduces the risk of entrapment. Birds using the tape are easier to handle when taken out of the cages for weighing and inspection and when being handled at the end of lay.



However, there have been complaints from farmers who have found that the strips fall off and wear out. The egg baffle plate must be cleaned to remove feed and faecal residues or dried saliva before attaching the abrasive strip so that it sticks properly. In new cages an oil film often protects the sheet metal and this protective layer must be cleaned with an appropriate solvent to ensure that the abrasive tape sticks to the metal. The strips need regular checks and have to be renewed after two years.

Abrasive paint

Abrasive paint comprises a mixture of fine sand (0.4–0.8 millimetre grade) and primer paint. The thick paint mixture can be applied quickly and easily with a spatula in a 5–6 centimetre wide band onto the egg baffle. The paint is more effective in reducing claw length than abrasive strips due to the larger abrasive area provided to birds and its superior abrasive properties and durability.

4.8 Deterrents—anti-peck compounds

Treating the everted vent of hens suffering vent trauma or other pecking wounds with a stock wound spray deters other hens from pecking at the wound. Spraying of a product such as SeptiClenze Spray could be used as a preventative for vent trauma and may overcome the need to beak tip. Use of SeptiClenze Spray as a preventative would only be effective on small farms that have the time to spray the birds fortnightly from four to 30 weeks of age. However if there are blood stains on eggs from caged birds it is worth spraying the vent of all hens in that cage as a preventative measure. In barn systems, only spray the birds with pecking damage.

Other compounds that have been applied to wounds of pecked birds are Stockholm tar, Vicks Vapour and Lotagen Gel. Check that compounds being applied do not result in a pain response from birds.

It is important that birds being treated for wounds are separated from the flock and that the withholding periods are adhered to before eggs or birds are sold.

Use of a stock wound spray recommended by veterinarians may deter other hens from pecking at a wound.

4.9 Use of fitted devices to prevent pecking

Spectacles (restricting vision of birds)

Spectacles or blinkers (anti-pecking devices made of a coloured flexible polyethylene material) fitted on the nares (nostrils) of the hens allow birds to look to the side or down but not directly ahead. They were effective in controlling feather pecking and improving feather cover, but these mechanical devices have disadvantages. They can only be put on birds of pullet size or larger, they are relatively expensive and they take considerable time to fit to the bird. They cannot be used in cages because they interfere with eating and drinking and can be easily dislodged. These devices are held in place by metal clips, that pierce the nasal septum, which is a welfare concern.

The use of blinkers and other vision impairing equipment to prevent pecking must only be used with veterinary advice.

Lenses

Red contact lenses were first used in the 1960s for layers as an alternative to beak tipping. They failed to gain popularity because they caused considerable eye irritation, eye infections, abnormal behaviour, and they were not kept in place well. The lenses were redesigned in an attempt to eliminate these problems and have been claimed to keep birds calm, eliminate the need for beak tipping, eliminate cannibalism, reduce feed usage and increase egg production. More recently coloured contact lenses for laying hens have been introduced. Hens fitted with red lenses (rosy glasses) appear to be the least stressed.

Under the Welfare Code contact lenses must not be used in poultry to prevent pecking as they cause eye irritation and infections and abnormal behaviour.

Biting devices

Plastic anti-pecking devices have been developed for use in game birds. They are held in place by lugs inserted in the nares. In pheasants, rings are fitted in the nostril and between the upper and lower beak. This bumper device protrudes beyond the beak tip to prevent complete closure of the beak. The use of bits as a preventative measure against feather pecking is not permitted in many countries including Australia.

4.10 Health

Pecking mortality in a flock is often initiated by a health problem. There is little competitive activity when there is good uniformity and all birds are healthy, but when there is loss of uniformity and a wide variance of quality in the flock then dominance pressures emerge. This then becomes further exacerbated by learnt behaviour. Unhealthy birds must be rigorously culled. If the flock appears stressed check for, and manage the factors causing the stress.

Birds are attracted to peck at the reproductive tract when it is exposed during egg laying. Inflamed cloacae from enteritis, spontaneous haemorrhage of cloacae or bulging cloacae at onset of the first egg also attract pecking. Injuries attract pecking at damaged tissue. Aggressive individual birds will attack sick, weak, small or odd coloured birds. These aggressive birds will also attack during the period when there is a change from fluff to feathers in young birds.

Poor health or stress in flocks often initiates severe pecking which may result in mortality. Birds with poor health are at risk of pecking attacks from healthy birds.

SUMMARY

Pecking and cannibalism in pullets during rearing is strongly correlated with the occurrence of these behaviours in laying flocks. Vices acquired during the rearing period are irreversible during lay.

Strategies to manage feather pecking and cannibalism:

- Use strains of birds that have a reputation for low feather pecking and cannibalism.
- Give young chicks the chance to rest and sleep using lower light levels and avoid overcrowding during brooding.
- Manage pullets so there is uniformity of body conformation and weight.
- House birds from day old to end of lay preferably in the same facility or provide similar equipment and layout in both rearing and laying facilities.
- The method of rearing used should suit the type of housing used for the laying flock.
- Provide good quality litter to stimulate ground pecking and dust bathing in the early rearing period of barn and free range reared birds.
- Provide high fibre diets and avoid using low protein diets that are deficient in sulphur amino acids.
- Encourage free range birds to use the range by providing trees, shelter belts, temporary fence lines, forage, shade and sand baths.
- Maintain light intensity at 5–10 lux in cage systems and avoid sharp changes in light intensity.
- Avoid using high stocking densities.
- Provide sufficient feeders and drinkers.
- Avoid relocating hens to other cages in a shed except where housed singly.
- Enrichment devices reduce harmful behaviours.
- Abrasive material in the feed trough can blunt the beak.
- Claw abrasives blunt the claws of birds and prevent claw injuries to other birds.
- Fitting spectacles can reduce social stress in birds but is costly and cannot be used in caged birds.

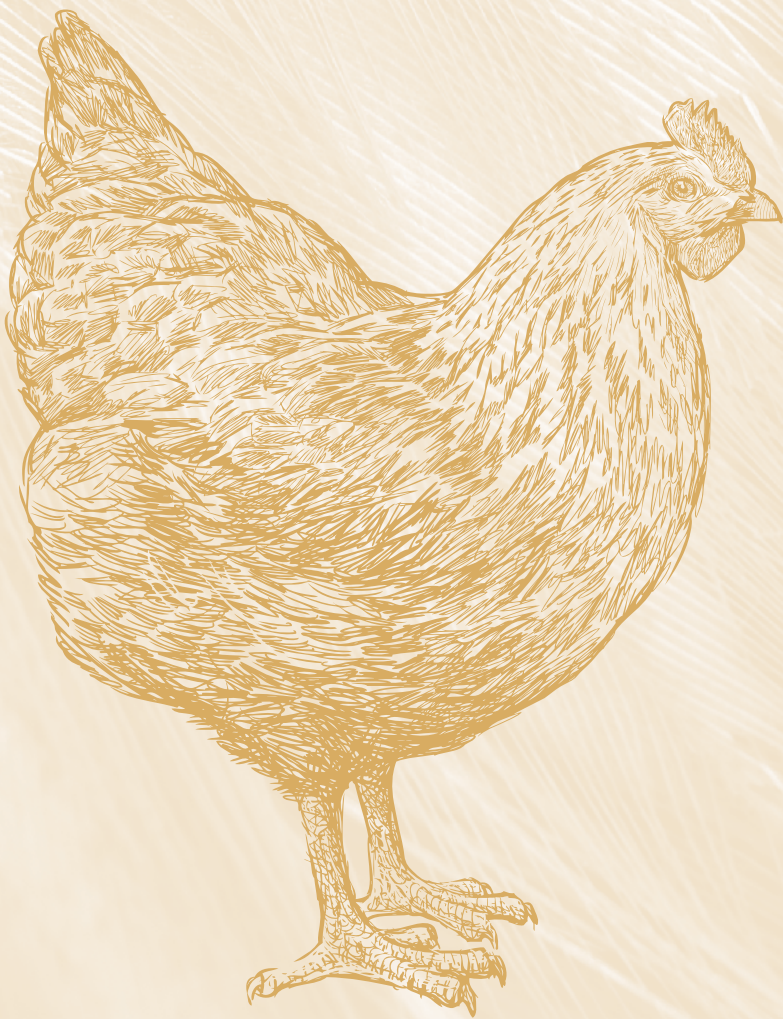
REVIEW ACTIVITIES

1. Could you use any of the alternatives mentioned in this chapter to reduce the risk of a severe occurrence of feather pecking or cannibalism?
 Yes
 No
 Possibly
2. Do you discuss with the breeder company the most suitable bird strain to use for the housing system you have?
 Yes
 No

BEST PRACTICE

- Select breeds or strains that have low levels of feather pecking and cannibalism.
- Use low light intensity to control feather pecking during rearing and laying.
- Provide good quality and adequate depth of litter.
- Keep variation in flock pullet body weight to a minimum.
- Ensure the method of rearing suits the type of housing for the laying flock.
- Provide high fibre diets and avoid using low protein diets.
- Encourage use of the range by providing trees, shelter belts, forage, shade and sand baths.
- Avoid using stocking densities above the recommended levels.
- Provide sufficient feeders and drinkers.
- Light the entrance to nest boxes, but maintain darkness inside the nest box.
- Avoid relocating hens to other cages in a shed except where housed singly.
- Use abrasive material in the bottom of moving hopper style feed troughs to blunt the beak.
- Use pecking stones to help abrade the beak and occupy the birds.
- Use claw abrasives to blunt the claws of birds.





BEAK TIPPING IS USED TO MINIMISE THE RISK OF SEVERE PECKING AND CANNIBALISM IN CONJUNCTION WITH GOOD HUSBANDRY PRACTICES.

This chapter will enable you to become familiar with the variety of beak tipping procedures available.



Chapter 5

BEAK TIPPING METHODS

You should be able to:

- identify appropriate ages to beak tip your birds
- identify the most suitable available method of beak tipping your birds
- identify the methods of beak tipping birds.

5.1 Introduction

Given the continuing welfare scrutiny of any form of beak tipping and the ban in the European Union on using a hot blade to cut the beak, attempts have been made to develop more welfare friendly methods of beak tipping. The infrared and laser methods are two recent technologies which have been investigated. The infrared (beak treatment) method is now used routinely worldwide in developed countries including Australia. The hot blade beak trimming method continues to be used in Australia mainly for re-trimming flocks that have been treated at day old with the infrared method. However in small hatcheries where the infrared method is not available hot blade beak trimming is still used.

Beak tipping is a delicate operation that should only be carried out by qualified operators who must comply with current welfare code or standard. It must be done correctly and uniformly.



Beak trimming involves removing the tip of the upper and lower beaks.

The term debeaking is misleading as the whole beak is not removed.

Beak tipping reduces the dominance one bird has over another.

Flocks are beak treated or trimmed to shorten and blunt the beak so that pecking cannot do any great damage to a bird's body.

The use of a correct beak tipping program helps prevent heavy losses of chickens and pullets from cannibalism and in the laying stage from vent pecking. Without the correct strategy mortality of up to 25–30 per cent of the flock can occur, causing impaired bird welfare as well as huge financial losses.

5.2 History of beak tipping

The words debeaking, partial amputation, beak trimming, beak tipping and beak treatment have been used to describe the process. Paring of the tip of the top beak using a sharp knife and beak burning were the first methods used by poultry farmers to control cannibalism in laying flocks. Infrared treatment and hot blade trimming are the approved methods in Australia. The older methods mentioned are inefficient and not welfare friendly.

Soldering iron

Initially a gas torch was used to burn off part of the upper beak. Later a soldering iron was modified to give it a chisel edge and this enabled the operator to apply downward pressure on the upper beak to sear and cauterise the beak. The Lyon Electric Company in North America used these modifications to develop the first beak trimming machine that consisted of a heated knife attachment on a homemade beak support and frame. The machine was registered in 1943.

A simple inexpensive device used in the early years of the poultry industry for beak trimming birds consisted of an ordinary electric soldering iron. The edge of a brass or copper disk was sharpened like a blade and welded to the tip of a soldering iron. The disc on the soldering iron reached a temperature of 327°C, which was sufficient to cut and cauterise the beak. This method is still used by some backyard poultry keepers who do not have access to a hot blade machine to trim the beak and prevent feather pecking and cannibalism.

Cold blade

The first cold blade method involved separating the tip of the beak from the deeper structures by traction or tearing. A short cut was made into one side of the beak with a knife and the flat side of the blade was placed against the cut portion and raised to loosen the beak edge. The tip was removed by applying downward traction.

Another method was to use a sharp jack-knife to make a nick in the beak with the thumb holding the cut portion of the beak against the blade. The knife was rolled around the tip of the beak tearing off the horny portion and exposing the quick.

Secateurs have been used to trim the upper beak of turkeys and layers at one, six or 21 days. A dog nail clipper has also been used.

Cold blade methods are a temporary form of beak tipping. They are not used in the commercial industry but are used by some backyard poultry keepers who do not have access to a hot blade machine or soldering iron to cut the beak tip.

Bio beak tipping

The bio beaker used a high voltage AC electrical current across two electrodes to burn a small hole in the upper beak. Up to 2000 day old chicks could be trimmed per hour. The beak was inserted into the mask of the instrument and it took 0.25 seconds to burn a hole in the beak. The advantage of this method was that the beak tipping was done at day old, making the unit ideal for use in the hatchery. The treated chickens could eat and drink normally for the first few days while their beaks were intact. It was originally hoped that after a period of three to seven days, the tip of the beak would die and erode leaving a rounded stump. Unfortunately in many chicks the tip did not erode and birds had to be re-trimmed using conventional hot blade equipment.

The bio beaker was used in the turkey industry but has now been replaced by the infrared and hot blade methods.

Robotic beak tipping

A 'Robot AG 4500' machine was made by Gourlandt Industries Inc. in France. The machine permitted simultaneous, automated beak tipping, Marek's (subcutaneous injection) and Newcastle-Bronchitis (eye drop) vaccination of day-old chicks. The AG 4500 was suitable for vaccination but problems emerged with the beak trimming operation. The chicks were loaded onto the robot by hand and held by cups around their heads. If the chickens were not loaded correctly they could drop off the line and receive either excessive beak trimming or very light trimming. The machine could not beak trim chickens effectively if there was a variation in the weight or size of chickens and it has not been used in recent years. The Robotic machine trimmed 4500 chickens per hour.

Chemical beak tipping

Capsaicin is a cheap non-toxic substance extracted from hot peppers and when used induces a mild behaviour response. Capsaicin has been applied at the time of conventional hot blade beak trimming to decrease the rate of beak regrowth and hence the need for re-trimming. Operators must avoid contact with the substance during its application to the beak. This method is not currently used for beak tipping.

5.3 Infrared beak treatment

Infrared beak treatment (IRBT) is a process developed by Nova-Tech Engineering in North America and is the second most popular tipping method used worldwide today on poultry, ducks and turkeys. The system uses a non-contact, high intensity, infrared energy source to treat beak tissue in a bloodless procedure. The IRBT Poultry Services Processor (PSP, as shown at right) is designed to minimise bird handling and administer several treatments, including vaccination, to the bird at the one time. The equipment is only available on lease.

An infrared lamp delivers an energy pulse that penetrates the hard outer layer of the beak treating a pre-determined amount of tissue, which inhibits further growth of the beak tip. Unlike hot blade trimming, the beak surface remains intact, protecting the treated soft tissue underneath.

IRBT is applied to chicks on the day of hatch in a biosecure hatchery environment. In the commercial layer industry, the process is applied after hatchlings are sexed so that only females are treated. Both male and female breeder chicks are usually given a slightly lighter treatment than layer chicks.

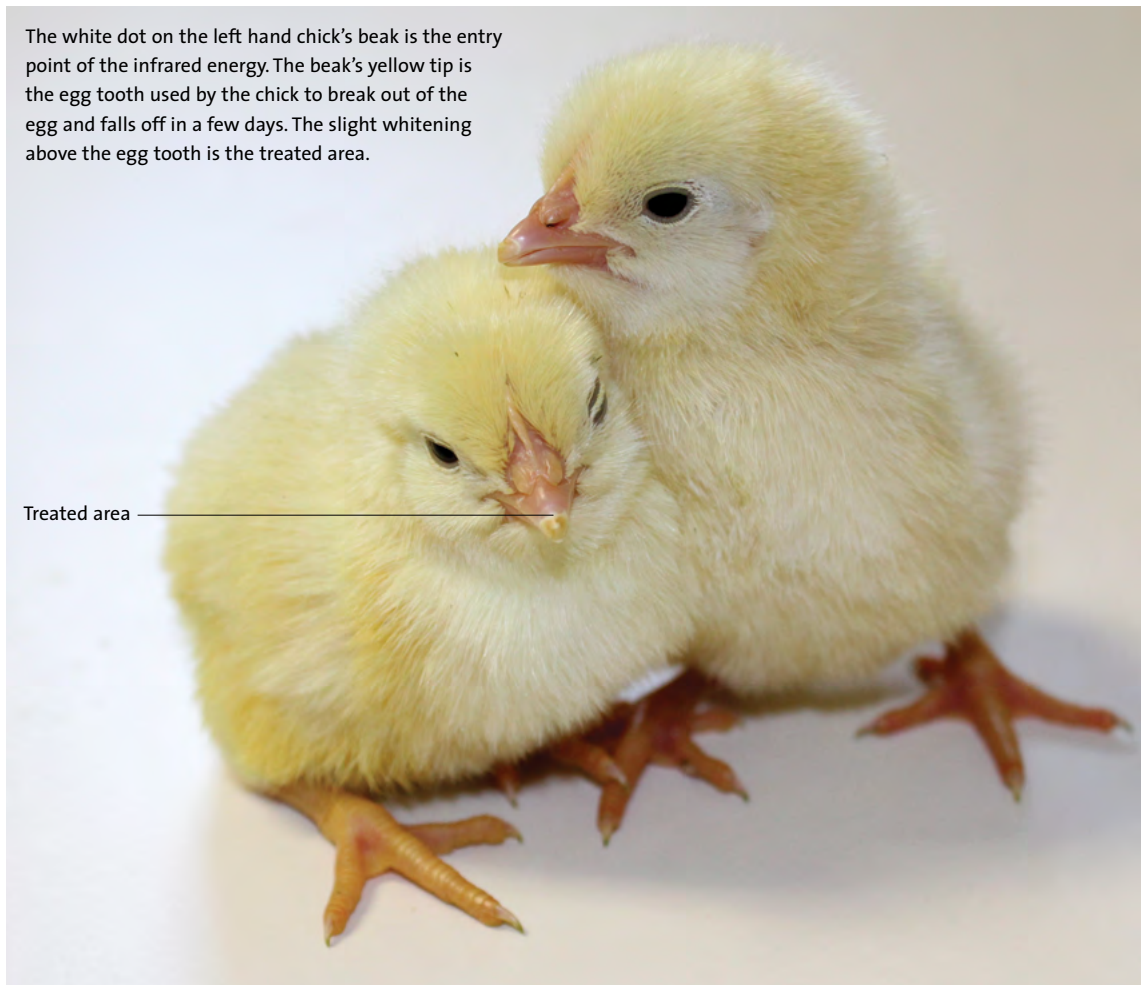
The infrared machine has a fixture that is moulded to the shape of the bird's face. Fixtures are made to fit the head shape of each strain and type of chicken enabling repeatable treatment for chickens with different sized heads and beaks. Consistent treatment is achieved by selecting the appropriate lamp power and mirrors that focus the light on the upper and lower beak. The optimal energy pulse power, exposure time and depth of treatment are determined by the breed or strain of bird and farm environmental factors. Interchangeable hardware and the PSP's control program manage all these variables.

Commercial hatcheries using the IRBT processor follow a quality assurance protocol. The vendor provides training and a certification program to ensure the equipment is set up correctly and a consistent amount of beak is treated. The treatment team is trained to establish the settings on the machine; pick up, hold and load chickens on the machine correctly; monitor treatment application using quality control protocols and chick health after the process; consign treated birds to farms and follow up monitoring on the quality of beak treatment during rearing and lay.

To enable consistent application of the treatment it is important that hatcheries hatch good quality chickens by following recommendations in the breeder's guide.



The white dot on the left hand chick's beak is the entry point of the infrared energy. The beak's yellow tip is the egg tooth used by the chick to break out of the egg and falls off in a few days. The slight whitening above the egg tooth is the treated area.



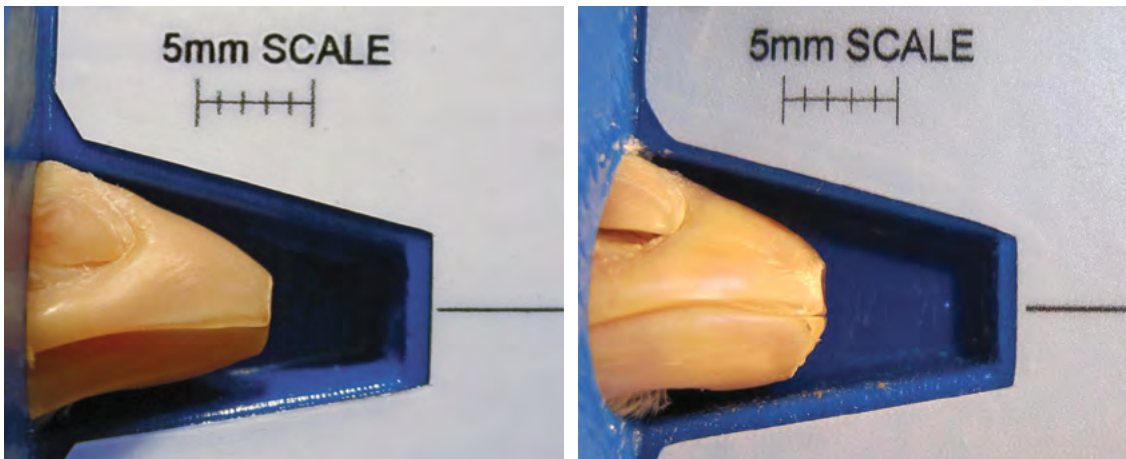
Managing infrared beak treatment

IRBT is a precise technology and the effects on beak tissue and beak regrowth over time are not the same as hot blade trimming. IRBT requires different standards for correct application than for hot blade trimming.

By design, the tissues that continue to grow and expand the beak skeletal structure after the treatment are not entirely in the exposed treatment zone because it is important to keep these structures intact to enable adequate beak growth for bird health and welfare. As the lower beak has greater potential to regenerate, slightly more of it may be treated to improve the beak's long-term shape.

The IRBT process treats the epidermis (outer layer of beak) but has minimal impact on the underlying tissue (dermis) that lies between the bone and epidermis. The dermis contains numerous nerve fibres and blood vessels that continue to function and allow normal growth of the beak after treatment except at the growth site of the beak hook where all the tissue is treated. This has welfare benefits due to the absence of long-term or persistent neuromas, as well as a better beak shape leading to more uniform flocks.

Immediately after treatment the beak looks the same as it did before the process except for a whitening of the tip and a white dot on the surface of the upper beak (see photo above). The bird is able to use its beak normally and within a week the tip softens, and two to four weeks after the treatment the sharp hook of the beak sloughs off. At four weeks of age infrared treated birds have a longer beak than those trimmed with the hot blade method.



Typical treated beak shapes for 28 day old chickens to be housed in controlled environment light proof house (left) and in free range open-sided housing (right). Select the treatment prescribed for the hen's future living environment.

The amount of treatment observed on the beak of chicks on day of delivery to the rearing farm may appear to be more than one-third of the beak length. Untreated beak tissue within the treated zone continues to grow after the process and the proportion of beak left at 28 days is greater than that apparent at day old. This is unlike hot blade trimming where tissue is removed and the cut surface cauterised. The rate of beak growth decreases with the bird's age and is strain dependent. Infrared treated beaks remain relatively unchanged in length after the process until the onset of softening and sloughing of the tip at seven to 14 days (whereas hot blade treated beaks are shorter). At 14 days after tipping treated beaks are intermediate in length but shorter than those that were hot blade trimmed. After 14 days, all beaks increase in length with the greatest growth in hot blade trimmed beaks. By 28 days the treated beak has no obvious neuromas and the regrowth does not result in a sharp hook. The beak continues to grow more slowly and the shape varies according to the amount of treatment applied.

Both IRBT and the hot blade method inhibit regrowth of the beak hook, however hot blade trimming causes more damage to the beak.

Because both the upper and lower beaks of layers and breeders will gradually regrow both beaks must be treated. It is important to keep these blunt during the bird's life to minimise severe feather pecking and cannibalism. If layer chicks have only their upper beak lightly treated the beak will regrow within two to three weeks and they can still cause damage when they feather peck. Applying a full treatment to only the upper beak results in a large step between the upper and lower beak making it difficult for birds to eat and drink.

A bird should be given no more treatment than the amount required for the conditions in which it will live. Slight adjustments are made to allow for the rate of beak growth which is related to chick type, strain and the environment where the chicken will spend its life. These factors determine the prescribed amount of infrared treatment applied. The difference at day old between a treatment for free range birds and a lighter treatment for birds in a controlled environment house is less than 2 millimetres of beak length.

Light intensity and temperature affect poultry. The lower the latitude (i.e. closer to the equator) the higher the light intensity and temperature that poultry housed in open-sided sheds or out ranging are exposed to. In Australia, the further north a farm is the more likely open-sided housing systems will be used.

Pullets and laying hens require optimal temperature (18–27°C), humidity (40–60 per cent) and little variation in light intensity to achieve their genetic potential in growth and laying performance, and to maximise their welfare. In low-latitude regions these environmental conditions exceed the ideal range for birds especially when they are kept in open-sided sheds or free range systems. Conditions that are less than ideal can contribute to bird stress, variation in feed intake, growth, production and birds may engage in increased levels of feather pecking and cannibalism. Such behaviours can be controlled by treating a slightly greater portion of the beak using infrared beak treatment.

The goal of IRBT is to apply the minimal amount of treatment in order to reduce the risk of cannibalism occurring in the environment where the birds are going to live. The amount required is determined by the likely beak length at age 60 weeks. A longer beak profile is prescribed for birds in low light situations and a shorter profile for birds exposed to more light.

Pullets reared in controlled environments are provided with lower light intensity than birds exposed to natural light. These pullets receive a lighter treatment to limit beak growth to a level that will prevent them from inflicting pecking damage on other birds. Birds housed in open-sided sheds with access to free range runs will be given a heavier treatment. Birds not having access to free range runs may receive a treatment that results in a stepped shape by eight weeks of age. Birds using non-chain feeders may require a slightly heavier treatment of the lower beak. These feeders abrade the lower beak much less than a chain feeder.

To ensure treatment is precise and consistent it is more appropriate for the hatchery applying the process to implement a quality assurance program that is supported by the PSP providers. This should include communicating with the farm purchasing the chickens and the farm applying a beak shape scoring program.

The quality assurance protocol developed by the manufacturers and industry ensures lamp power and beak exposure to infrared system are correct for the strain of bird and the housing environment they are placed in.

The use of correct head holders and correct placement of chickens in the infrared head holders result in good beak treatment.



Placing chicks on a PSB.

5.4 Hot blade beak trimming

Birds can also be beak tipped with an electrically heated thermostatically controlled cauterising blade to shorten and blunt the beak. The hot blade trimming method can be used at day old, five to 10 days old, four to six weeks old, eight to 14 weeks of age and as a touch-up trim for adult birds (mainly in barn and free range systems). Hot blade beak trimming on birds older than day old interferes with their growth and egg production. In Australia, if broiler and layer breeder flocks are not infrared beak treated, then both upper and lower beaks are usually hot blade trimmed when the birds are five to 10 days old. Small hatcheries without access to a IRBT machine may trim at day old if requested by the client.

Contract teams or farm staff carry out hot blade beak trimming. If the beaks of birds that have been infrared beak treated at day old regrow, and birds start to feather peck during the rearing period, the beaks will be re-trimmed at eight to 14 weeks of age using the hot blade method.

Supervisors of beak trimming teams (both contract and on-farm teams) must be adequately trained and accredited. They are responsible for training personnel and ensuring standards are maintained throughout the beak trimming of a flock. This ensures that nationally agreed standards are maintained so that bird welfare is not compromised.

Following the development of the original hot blade machine in 1943 there have been refinements to it including some control of blade temperature, cutting and cauterisation. Although thermometers are available the temperature of the blade is mostly assessed by its colour. The most commonly used blade colour is a dark (dull) red with an approximate temperature of 650–750°C. A cherry red coloured blade (850–950°C) is used for toe trimming.

One supplier of machines, the Lyon Electric Company in North America produces the Super Beak Trimmer with a precision beak trimmer-pak for layers, POW-R-Pak unit for automating the Super Beak Trimmer and Super V Beak Trimmer hot blade beak trimming machines. They also supply a variety of beak trimming blades and attachments to suit the age and type of bird.

5.5 Other beak tipping methods

Gas beak trimming

This machine consists of a hot plate and cutting bar operated by means of a foot lever. The efficiency of the machine varies with gas pressure and wind conditions. Generally it is slow but is a useful portable machine for trimming small numbers of birds. Farmers can currently purchase a pocket style machine, which uses gas from a cigarette lighter as its heat source.

Laser beak tipping

Research is being conducted using a laser beam and other light forms to treat the beaks of day old chickens. Many lasers are equipped with cooling systems to decrease temperature on the treated area, providing a mild anaesthetic effect. Laser tipping has the potential for welfare improvements but more work is required before it can be applied at industry level. A particular benefit is that the temperature of laser beams can be precisely controlled.

5.6 Beak tipping regimes

The age at which beak tipping occurs depends on the production system, breed or strain of bird and the farm practices used to minimise feather pecking and cannibalism and the tipping method to be used.

One tip

Infrared treatment at day old is preferable because it has minimal impact on chick growth. Hot blade trimming at five to 10 days can set chicks back at a critical growth period. Infrared treatment at day old is the preferred option for pullets that are to be housed in cages or in sheds where the intensity of natural and artificial light is low. A second trim at about eight to 14 weeks of age is usually unnecessary for these birds.

Two tips

Infrared treatment (first tip) is done at day old in the hatchery. A second tip or trim with the hot blade is carried out on-farm at eight to 14 weeks of age if the bird's beak has regrown enough to cause pecking damage. Less than 10 per cent of birds should need re-trimming and if more than 10 per cent need re-trimming then the quality of the first tipping should be discussed with the hatchery or contract team.

This regime is often used for pullets to be housed in open-sided houses where there is exposure to natural light. It may also be done on pullets destined for free range production systems.

Trimming birds during lay

Some adult birds may need trimming/re-trimming with a hot blade if a pecking outbreak occurs.



5.7 Hot blade beak trimming versus infrared beak treatment

The advantages and disadvantages of hot blade trimming versus infrared treatment are presented in the following table.

	Hot blade beak trimming		Infrared beak treatment	
	Advantages	Disadvantages	Advantages	Disadvantages
Biosecurity	<p><i>Hatchery</i> Equipment located in clean hatchery. Staff maintain high levels of biosecurity.</p> <p><i>On-farm</i> Use of farm staff maintains biosecurity.</p>	Contract teams move from farm to farm. Potential biosecurity risk with personal hygiene and equipment cleanliness.	Equipment located in clean hatchery. Staff maintain high levels of biosecurity.	
Bird catching		Birds can be stressed from catching and restraint on-farm.	Reduced stress from handling and holding chickens.	
Equipment set up	Equipment located in hatchery enables consistent settings to be used.	On-farm, set up for equipment varies depending on shed design and floor type.	Stable placement of equipment located in hatchery enables consistent settings to be used.	
Beak tipping procedure	Experienced operators can judge the amount of beak to remove. Accurate beak trimming minimises problems later in the bird's life.	Physical damage to the birds while being handled for beak trimming. Exposed cauterised wound. Potential for bleeding from the beak. Higher risk of excessive or insufficient beak being trimmed. Difficult to maintain consistency of trim.	Precise control of amount of beak to be removed. The tissues exposed to infrared light remain intact. There are no open wounds or blood loss. A more precise and consistent treatment can be maintained.	Restrained by head on automated carousel for 10 seconds. Excessive energy can damage soft tissues and impair beak function.
Re-trimming	Birds can be re-trimmed at any age with the hot blade.			Re-trimming can only be performed with the hot blade.
Quality of beak tipping	Quality assurance implemented by farm and contract team. Includes checks on accuracy, consistency and cauterisation of trim during and after trim.	Difficult to precisely control accuracy and consistency of trim.	In-house quality assurance program used. Includes regular checks on treatment accuracy and consistency on farm.	

	Hot blade beak trimming		Infrared beak treatment	
	Advantages	Disadvantages	Advantages	Disadvantages
Neuromas		Minimise risk of neuromas forming by trimming at day old. Risk increases if residual beak is less than two-thirds of original beak length.	Absence of long term or persistent neuromas.	
Infection risk	Infection is low provided hygiene of machine, crew and farm is good.	Infection likely if cleanliness and hygiene standards of trimmers and farm are poor.	No open wounds or blood loss. Infection risk is very low.	
Records	Records kept on beak trimming quality and bird performance.		Records kept on beak treatment quality and bird performance.	
Evaluation	Trimmers and farmers evaluate performance of birds after trimming.		In house monitoring and evaluation of records of beak treatment and follow up on-farm bird performance and beak condition.	
Summary	Open wound, re-trimming commonly practiced to control pecking.		A better beak shape, leading to more uniform flocks. No open wounds; more reliable, precise and consistent treatment, beak condition superior. Treatment amount is matched to chick type, strain and its living environment. If beak regrowth is excessive, re-trimming required with hot blade to avert cannibalism.	

Adapted from 'Hot blade beak trimming versus infrared beak treatment', sourced from poultryhub.org

SUMMARY

- Flocks are beak tipped to shorten and blunt the beak so that pecking cannot do any significant damage.
- Beak tipping is carried out at various ages depending on the preference of the farm manager.
- Hot blade re-trimming is carried out if a bird's beak grows back enough to cause pecking damage.
- Infrared beak treatment can only be done on day old chickens at the hatchery.
- Contract teams, individual farmers and farm staff on some large poultry enterprises carry out hot blade beak trimming.
- Debeaking, partial amputation and beak treatment have been used in the past to describe the process. It is now described as beak tipping, beak trimming and beak treatment.
- Infrared beak treatment is the most consistent, reliable and widely used method.
- Beak condition and overall bird performance and welfare are better in infrared treated birds than in hot blade trimmed birds.

REVIEW ACTIVITIES

1. What is your current beak tipping method?

- None
- Hot blade
- Infrared
- Other methods _____

2. How will you keep up with changes in beak tipping technology?

BEST PRACTICE

- Infrared beak treatment at day old is the most effective means to beak tip birds and gives consistent results with good welfare outcomes.

BEST PRACTICE HOT BLADE TRIMMING WILL ENSURE THAT CANNIBALISM IS MINIMISED IN FLOCKS.

This chapter will help you to monitor the hot blade beak trimming process.



Chapter 6

BEST PRACTICE HOT BLADE BEAK TRIMMING

You should be able to:

- recognise if hot blade equipment is set up correctly for your birds
- identify that birds are handled according to best practice
- identify best practice hot blade beak trimming
- ensure best practice biosecurity is implemented.

6.1 Introduction

The hatchery manager and/or farm manager have the responsibility for birds during and after the hot blade beak trimming process. Hatchery and farm managers must ensure that the welfare of birds is not compromised. There are a number of precautions a farm manager can take to ensure the process goes well and a number of actions that should be taken if problems arise.

6.2 Communication

It is essential that the beak trimming team contacts the farm manager before starting the job. The team supervisor will confirm the following with the farm manager:

- the location of farm
- person to contact on arrival
- how to contact that person
- farm biosecurity requirements
- quantity and age of birds to be beak trimmed
- location and order of birds to be trimmed
- beak trimming standard required
- any other issues.

Regular communication should be maintained during the job. This ensures that there are no misunderstandings and changes can be made if required. The beak trimming team must give a report to the farm manager when the job is completed. This will alert the manager to any problems and will assist with management of the birds.

6.3 Biosecurity

Your business relies heavily on the health of your flock. Because prevention is the best approach when dealing with infectious disease, the biosecurity procedures adopted by your farm are of high importance. If these procedures are followed properly and diligently the potential for an infectious disease outbreak on your farm is considerably less.



The farm manager needs to reinforce farm biosecurity and communicate the requirements with the hot blade beak trimming team. Contracted beak trimmers move from farm to farm and are a high biosecurity risk. Managers need to:

- check that vehicles are cleaned and sanitised before entering the farm
- check trimming equipment cleanliness
- check trimmers' hygiene standard is high and that they wash their hands before and after each trimming session
- keep records of trimmer visits
- dispose of dead birds and waste material in a way that meets environmental and biosecurity guidelines.

There are several aspects of biosecurity and beak trim teams that need to be addressed. However due to differences in location, size and layout, each farm and business will have their own set of procedures. Follow biosecurity procedures diligently as failure to do so could result in incoming pests and disease, affecting flock production which in turn affects your business productivity, and ultimately its viability and your job.

The Australian Code of Practice for Biosecurity in the Egg Industry (2nd Edition) and the National Farm Biosecurity Technical Manual for Egg Production (2015) set the minimum standards required for biosecurity measures in commercial layer businesses. However, individual farmers may have their own set of biosecurity procedures that go above and beyond the standards set out in the Biosecurity Code.

Egg Standards Australia (previously Egg Corp Assured) provides information and training that helps businesses to develop their own procedures including biosecurity for inclusion in the enterprise's quality assurance program. Farmers who would like more information should contact Australian Eggs.

Beak trimming team biosecurity

Beak trimming team members should:

- visit only one farm per day
- follow the non-poultry contact times
- notify the manager on arrival
- sign biosecurity declarations when required
- follow the biosecurity instructions provided by the farm or hatchery manager
- wear clean clothes and boots
- maintain personnel hygiene—including washing hands regularly
- clean and disinfect equipment between flocks and farms/hatcheries
- clean and disinfect vehicles before entering farm/hatchery
- clean and disinfect vehicles before leaving the farm/hatchery
- keep a diary of all farm visits
- do not bring any animals onto the farm
- do not keep, or come into contact with, other birds such as ducks, geese, emus, ostriches, pet birds, pigeons or pigs
- do not keep domestic birds at home.

The beak trimmers should use the designated parking and change areas available on the farm. Farm managers should provide portable footbaths and request that beak trimmers use these. Beak trimmers should dispose of over-boots and other disposable items in appropriate bins provided by the farm manager.

It is best if farms provide their own catching frames and footwear in order to lessen biosecurity risks.

6.4 Setting up the trimming machine

The non-cage farm manager should check that beak trimmers set up their equipment close to where the birds are penned in order to minimise the time required to carry birds to the work site. The equipment should be placed in a well-lit area (at least 150–200 lux) and be set up so that it remains stable during the operation. Most operators have a small globe that is attached to their machine to maintain similar light intensity for each beak trimming job.

In cage facilities the trimming equipment is set up in the aisle adjacent to the cages of birds to be beak trimmed. As each column of cages is trimmed the equipment is moved along the aisle. The birds in one cage can be trimmed and placed into a crate. Then the birds in the next cage are caught, trimmed and placed into the empty cage. When all birds are trimmed, those in the crate are placed into the empty cage.

6.5 Managing hot blade beak trimming

Bird behaviour

During hot blade beak trimming, birds will react to trimming by vocalising and exhibiting escape behaviour. Farm managers should be aware that excessive vocalisation and escape responses might be an indication that beak trimming is not being conducted effectively and should be reviewed immediately. Chickens could suffer shock from the operation, huddle and develop a shivering response during and after the operation. Farm and hatchery managers should observe the response of chicks after the procedure and determine whether their response is normal.

Water cooling

During the hot blade beak trimming process the cutting bar of the trimming machine can become hot. Most machines allow for the fitting of water-cooling equipment to the cutting bar as this helps to prevent burns to the bottom of the beak as it is placed onto the cutting bar before the blade is lowered to cut the beak.

Incorrect holding

Holding the bird incorrectly can lead to problems during beak trimming. Problems include burnt tongues, the top beak being too short, and the bottom beak being too long or too short. The beak should not be pulled away from the blade until it is completely cut as this will prevent tearing of the tissue in the roof of the mouth.

Overheated or underheated blades

The ideal blade colour is a dark cherry red when observed in low light intensity in pullet rearing sheds. A bright red/orange colour softens the edge of the blade quickly and increases the risk of burns to the face of the bird and the hands of the operator.

Overheating the blade will cause it to warp under pressure and cause blisters in the bird's mouth.

The horny covering of the beak in younger birds can be hard and not readily flexible. If the blade is cold or blunt it is likely to fracture the beak and can cause sensitive bulb-like growths on the cut end of the beak.

Use of guides or templates

Guides or templates with holes for the beak to be placed through are sometimes used to ensure beaks are trimmed to the desired length. The hole size is set for the beaks of birds at a given age (commonly day old and 10 weeks).

Birds must be of uniform weight or size if a consistent residual beak length is to be achieved. Variation in bird size or trimming the beaks earlier or later than the design age for the guide result in the residual beak being shorter or longer than desired.



Pushing the beak hard into the hole will result in the residual beak being too short, damage to keratin layer or bruising/injury to the head.

Foot pedal switch versus finger trigger

Either a foot pedal switch or finger trigger is used to engage the heated blade once the chicken's head/beak is in place on the bar. The foot pedal is preferred as the trimmer may move the beak slightly when tripping the finger trigger offsetting the beak angle on the bar resulting in a uneven trim.

Bleeding birds

An increase in the number of bleeding birds can be a result of how they are handled or because the blade is either too hot or too cold. If more than 1 per cent of birds bleed there should be a review of the catching, handling and cutting processes to determine if they need to be modified.

During hot weather, farm managers should ask that beak trimming cease when temperatures reach 33°C in the production facility, as more birds will bleed at high temperatures. In hot weather beaks can be over-cauterised increasing the incidence of beak dieback where up to 3 millimetres of beak tissue will slough off rather than regrow.

Birds that are bleeding after beak trimming attract the attention of other birds giving them a taste for blood. After trimming it is common to see birds gently pecking at the wound on the beaks of other birds. If a bird is bleeding after trimming it is recommended that an extra one second of cauterisation be applied to seal the wound. After two tries at unsuccessfully cauterising a bleeding beak, place the bird aside to let the beak cool down before attempting another cauterisation. The beak of the bird could be dipped in iced water soon after trimming to cool the wound and prevent further bleeding.

Check birds regularly for correct application of trim.

Cannibalism can be initiated on birds that are bleeding after hot blade trimming.

6.6 Workplace health and safety

Operator comfort

Some hot blade trimmers like to stand while others prefer to sit. Workplace health and safety considerations require that seating is adequate. Farm managers should encourage beak trimmers to avoid bending awkwardly when picking up birds to avoid back injuries. The activity flow, work height and workspace in the beak trimming area should enable a smooth movement of people and birds to and from the beak trimming operator.

Regular breaks

Maximum concentration must be maintained to ensure a proper job is done. About 15 chicks can be trimmed per minute, however it is difficult to maintain full concentration throughout the whole day. Regular breaks of five minutes each hour are required to minimise errors.

Air quality

The air quality of the environment for beak trimming operators is often poor because of high dust levels, ammonia smells and the presence of other toxic gases, which can lead to an adverse working environment for the team. As the beak is being cut, odour from the burning tissue together with any dust decreases the air quality in the working area.

Farm managers should make sure work areas have good air quality.

Farm managers should ensure that when beak trim equipment is set up, smoke from the work site is ventilated away from the operators. A chimney or vent 450 millimetres long attached to the top of the hot blade machine with a built-in 9 watt fluorescent spiral light bulb provides heat to create an upward draft and quickly vents the smoke away from the operator. The globe is positioned so that some light is directed downwards toward the blade to assist the trimmer.



The beak trimming team should wear masks to prevent long-term respiratory problems from continual exposure to poor air quality. All respiratory equipment for poultry workers should meet Australian standards and be at least Class P2, which ensures the capture of small dust particles found in poultry sheds so they do not enter the respiratory system. The mask must fit snugly. A respirator fitted with an exhalation release valve will improve the comfort of the wearer, especially under hot, humid conditions. Full face masks and helmets are available which provide fresh air to the operator when working in a dusty or smelly environment.

High dust levels can impact both birds and staff. Poor management or high levels of dust can also lead to equipment failure and/or electrical fires.

Injury to handlers and trimmers

There is the potential for staff handling birds to sustain injuries (such as lacerations on exposed skin) from birds' claws, particularly when trimming older pullets. Careful and gentle handling of birds reduces the risk of panic in birds and injuries to staff. Because operator fingers are in close proximity to the hot blade, the wearing of cotton lined gloves lowers the risk of finger burns and the trimmers fear of being burnt. Iced water and a first aid kit should be on hand in case an injury occurs.

Electrical safety

Farm managers should insist that beak trim equipment (including electrical cords) has been checked for electrical safety within the previous six months. Extension cords should be on retractable reels and positioned so they are not in the way of people moving in and out of the shed or when catching birds.

6.7 Handling birds

Bird welfare during handling

- Poultry must NOT be caught, lifted or carried by the head, neck, wings or tail.
- Birds should be carried by both legs with their head hanging downwards. Holding a bird upside down by one leg can easily lead to hip dislocation.
- Up to five birds can be carried in each hand at one time depending on their live weight. (People with small hands will carry fewer birds at a time.)
- In non-cage systems, feed and watering systems and moveable perches should be removed before catching. This not only reduces stress and injury to the birds but also reduces the risk of injury to catching personnel.
- All escaped birds are to be caught and treated humanely.
- Care should be taken to prevent a flapping wing from hitting solid objects.

If handled gently, there is not a great deal of stress on day old chickens while they are being placed into boxes or plastic crates, however at five to 10 days of age (when hot blade beak trimming is normally done in lieu of infrared treatment) birds will panic and try to escape. When the re-trimming is done at 12–14 weeks the fear response is even greater. Shed lighting should be dimmed so birds do not over-react, particularly from staff movements.



Removing birds from cages

Birds have a high risk of broken bones from rough handling if the catching team rush to get the job done. This can be minimised by careful handling of the birds by removing them individually from cages, providing full body support and carrying them directly to the crate.

The use of crates can be avoided and handling of trimmed chickens can be reduced by dividing a cage in two with a piece of plywood cut to size and another piece partly over the opening of the cage section the trimmed chickens are placed in.

Adjust the height of a hot blade machine to match the cage level by shortening or lengthening the legs, adding a seat and provide mobility to the machine by adding wheels.

When pullets are reared in cages they can be very flighty. Some birds will clutch the cage floor and will need to be held by both legs to loosen their grip on the cage floor. Their body may need extra support as they are removed from cages to prevent wings being caught in the cage.



Penning non-cage birds

To reduce stress on birds, it is advisable that catchers wear the same type of clothing in a dull colour (e.g. khaki, navy) and move slowly and quietly through the shed. Bright coloured clothing or any variation in type worn by staff can upset the birds.

When loose-housed birds are gathered, keep them calm to prevent smothering. Strategies include dimming lights, using corrals or partitions and removing food troughs, drinkers and moveable perches from the catching area before the catching begins. To avoid undue stress and/or injury, only an appropriate number of birds that can be caught relatively quickly should be corralled at any one time.

Birds are moved into one half of the shed and a portable fence placed at the midway point. A catching pen is set up at the dividing fence with the trimming equipment on the empty side. The birds are moved quietly into the catching pen without rushing them. They are then caught and passed over the fence to the trimmers. After beak trimming the birds are given access to the other half of the shed.

The size and position of the pen will vary according to the age of the birds, the weather and number of catchers. Pens and other barriers should be set up so that the time required for the job is minimised as this reduces stress on the birds.

If wire netting or weldmesh temporary fencing is used, covering the wire with hessian or shade cloth reduces the risk of birds packing into the sides or corners and suffocating. It is important not to overcrowd a pen. Check consistently for any suffocation or overheating and keep a constant watch for pile-ups in corners. Chickens should not be kept in confined surrounds for more than 15 minutes as they will overheat, especially in hot weather, and tend to bleed more after beak trimming.

Some birds will bleed after the beak trimming especially if they are stressed. Birds can be caught and temporarily put into crates to reduce panic. Do not use solid-sided crates as birds require adequate ventilation at all times.



Corner ramps reduce the risk of pile-ups.

Catching and handling five to 10 day old birds

Young poultry should be handled calmly and gently. Birds should be held correctly and firmly to prevent wing flapping as this will cause them to overreact when trimmed. How chickens are caught, held in pens and handled differs according to whether the chicks are brooded in cages or under hoover-type brooders, or whole-room brooded on the floor.

Hoover brooding

Five to 10 day old birds can be gently caught while still contained within the brooding surrounds, with the beak trimming equipment positioned outside the pen. Birds should be picked up by two legs and transferred directly to the beak trimmer. With five to 10 day olds, five chickens can be held in each hand. The operator can reach over the low fence to pick up the chickens from buckets or a crate or receive chickens directly from the catcher. The catcher should be located close to the beak trim operator.

Whole room brooding

The brooder room or shed should be divided in two and setup as described in the section 'Penning non-cage birds'.

Birds should be held correctly and firmly to prevent wing flapping as this will cause them to overreact when trimmed.

Returning birds to cages and floor

Ensure that the beak trimming team or farm staff assisting with the trimming return birds to the same group of birds (either cage, brooder surround, or section of shed) to lessen the effect of social stress.

When trimming is completed remove all pens and equipment and return the shed and equipment to normal including the lighting and ventilation.

6.8 Beak trimming day old and five to 10 day old chickens

Beak trimming is usually applied at day old or to five to 10 day old chickens if an IRBT machine is not available. Either block or step trim is applied to egg production stock. Different types of trim are applied to other species of poultry.

The chicken is held in a pistol grip to beak trim and either a block cut of one-third of the upper and lower beak or a step cut is applied. Light pressure is exerted on the throat to pull back the tongue to prevent it from being cut or burnt. Applying a little more pressure withdraws the lower beak slightly so that it is a little longer than the upper beak when the trimming is completed creating a stepped beak. Some operators use other ways of holding the bird.

The cauterising time is adjusted depending on bird age, strain and length of beak to be removed. A time of two seconds is a good starting point. Chickens with softer beaks (usually white strains) need less time for cauterisation.

Operators who push too hard on the chicken's head can cause internal bleeding and the chicken could die. Inexperienced trimmers tend to relax their hold on the bird, which can result in errors cutting the beak.

Operators who push too hard on the chicken's head can cause internal bleeding and the chicken could die.

6.9 Beak trimming at four to six weeks of age

Small-scale free range and hobby farmers who use larger-framed birds will beak trim their flocks at four weeks of age if the pullets are being grown on nipple-type drinkers. Most of the lower body weight hybrid strains commonly used in the commercial egg industry are treated at day old using infrared treatment. If IRBT is not available the chickens can be trimmed at four to six weeks of age using the block cut method of one-third of the beak.

At this age the bird may try to escape while being held for beak trimming. The bird should be held securely but gently so that if it attempts to escape the legs or wings are not injured.

Inexperienced trimmers tend to relax their hold on the bird which can result in errors cutting the beak.

6.10 Re-trimming beaks of pullets, laying hens and breeder flocks

Re-trimming of older pullets and layers is more difficult to manage. It is recommended that beak trimmers have both hands available particularly for re-trimming older birds. Holding birds with their heads down for extended periods may result in an increase in bleeding of beaks after trimming. Older pullets being re-trimmed can be taken out of rearing cages and transferred to the trim operator two or three at a time.

One method is to hold the bird with the thighs under the arm while pinning the wings between the forearm and body to prevent flapping. The free hand holds the head in a pistol-like grip with the beak as the barrel, or if only the top beak is to be trimmed the operator places the index finger of the free hand between the beaks to keep them open so the top beak can be cut. At the same time the finger holds down the tongue to prevent accidental burning. Another method is to hold the wings and legs together with one hand leaving the other hand free to hold the head as described above. The cauterising time is adjusted depending on the age of the bird and length of the residual beak. One second is a good starting point to prevent bleeding.

Re-trimming may only be required on a few birds in a flock but is done to avoid subsequent cannibalism. If birds are beak tipped properly at an early age further re-trimming is not necessary.



SUMMARY

Hot blade temperature

- The cutting bar gets hot during trimming.
- A cold or blunt blade will fracture the beak.

Set up. Poultry farmers and beak trim crews should ensure:

- Equipment is set up correctly.
- Appropriate position is chosen for beak trimming.
- Lighting is adequate over beak trim equipment and throughout shed.
- Correct blades are fitted and adjusted correctly.
- The equipment is maintained on the day of beak trimming.

Handling

- Birds are easily injured if not handled correctly.
- Birds must be handled calmly, gently but firmly during penning, catching and holding.
- When herding and penning birds make sure they do not panic.
- Never overcrowd a pen; check for suffocation.
- Do not hold more birds than recommended by the relevant welfare code, standard or guidelines.

Beak trimming

- Assess the bird's beak before trimming.
- Adjust the trim after the initial assessment is made.
- Beak length and shape are the most critical factors to assess.
- Ensure birds are held gently and securely during trimming.
- Ensure the pistol grip hold is used to ensure the tongue is retracted.
- Ensure the beak is square on to the cutting blade.
- Adjust cauterisation time according to age of the bird and ambient temperature.
- Re-trimming requires assessment of beak length and shape.



Biosecurity

- Biosecurity is required to minimise the spread of disease.
- Clear instructions are required to minimise problems.
- Maintain a high standard of personal hygiene.
- Do not have contact with backyard poultry or other avian species.
- Clean and sanitise equipment and vehicles.

General

- Observe behaviour of beak trimmed chickens at regular intervals.
- Check birds regularly during trimming.
- Assess beak shape and length regularly during trimming.
- Check beak length regularly.
- Check cauterisation of beaks regularly.
- Cease hot blade beak trimming when temperatures reach 33°C.
- Cervical dislocation is the most practical method for culling birds.
- Follow the accepted procedure for cervical dislocation.
- Record mortality for one week after beak trimming. It should not exceed 1 per cent.
- Cannibalism can be triggered if bleeding goes undetected after beak trimming.

REVIEW ACTIVITIES

1. What hot blade beak trim type/standard do you normally use at day old and five to 10 days of age?
 Block cut one-third of beak
 Other _____
2. What hot blade beak re-trim do you normally use at 10–12 weeks of age?
 Block cut one-third of beak
 Other _____
3. What hot blade beak trim do you normally use with adult birds?
 Block cut 2 millimetres of beak
 Block cut one-third of beak
 Other _____
4. What checks do the farmer and the beak trimmer make during the trimming process?
 Number of bleeders
 Bird behaviour
 Bird handling
 Beak trimmer skills
 Visual assessment of trimmed beaks
 Position of team in a shed
 External and internal conditions (temperature, ventilation, etc.)
 Other _____

BEST PRACTICE

- Use accredited hot blade beak trimming personnel.
- Seek support from the hatchery and breeding company to discuss the type of strain and tipping method to use for the housing system the birds will be kept in during the rearing and laying period.
- Monitor the progress and trimming standard of the hot blade beak trimming team during the process.
- Ensure feed and water is readily available and environmental conditions (lighting, ventilation, temperature) are ideal both during and after hot blade beak trimming.
- Keep records of bird mortalities, culls, light intensity, feed form, ventilation, stocking density, water quality and bird behaviour post beak treatment/trim.
- Discuss beak quality and length and associated bird performance with hatchery or trimmers throughout the life of the bird.



MAINTAINING A HIGH QUALITY OF BEAK TIPPING WILL ENSURE BIRD WELFARE AND PRODUCTION ARE MAXIMISED.

This chapter will help you to monitor the quality of infrared and hot blade tipping .

Chapter 7



ASSESSING THE QUALITY OF BEAK TIPPING

You should be able to:

- describe why beak tipping quality needs to be assessed in trimmed or treated flocks
- outline quality assessments for infrared treated and hot blade trimmed birds
- describe the indicators of poor beak tipping.

7.1 Assessing tipped beaks

It is best practice to beak tip only once and ensure it is done to a very high standard to avoid the need for re-trimming. If the percentage of birds needing to be re-trimmed is greater than 10 per cent then the farmer should take action to ensure that in future the first beak tipping is done to a higher standard. Monitoring the effectiveness of the beak tipping operation will identify birds with poor tipping and enable feedback to the hatchery or the trimming team on how well the job was done. It also measures how effective the tipping is at controlling beak regrowth over the bird's life. Assessing or scoring of the beak condition and shape is also a means of training staff to improve skills in observing the beak condition and shape during routine checks.

7.2 How much beak is tipped

Beak growth rate is related to weight gain in the bird. It is rapid in the first week, slower through to 12 weeks of age, then slow until maturity with only a slight growth from there on. The growth rate of the beak must be considered when tipping to ensure that any step created between the upper and lower beak does not become excessive and the tipping does not grow out during the bird's life.

Because the bird uses its beak for eating, drinking, grooming, exploring its environment and for aggressive and defensive activities, the external keratinised layer may show some wear over time.

Correct application of the tipping method used reduces the need for a second beak tip later in the life of the bird.

Beak growth rate, age when tipping is done, cauterisation time if hot blade trimmed and productive life of poultry determine whether the upper, or the upper and lower beak is tipped and how much of the beak is tipped. A meat chicken lives for six to 12 weeks, a meat breeder 58–65 weeks and a table egg layer 70–120 weeks. To obtain effective control of feather pecking and cannibalism in fowls both the upper and lower beak are tipped except in meat chickens.

The incidence of feather pecking and cannibalism is low in meat chickens. They have a life of six to 12 weeks and a light tipping of the upper beak is used if pecking and cannibalism is likely to occur. The upper beak regrows quickly, returning to its original shape within two to three weeks.

Both top and bottom beaks are tipped in male and female meat breeders if feather pecking is considered likely. The females also benefit from improved feed intake and persistency of lay. Males are also tipped to protect the females from damage during mating.

In table egg layer chicks both the upper and lower beaks are tipped to control the very high levels of feather pecking and cannibalism that may occur throughout the rearing and laying period.

7.3 Assessing the quality of beak tipping

Monitoring identifies birds with poor tipping and measures the effectiveness of the tipping at controlling beak regrowth over the bird's life. Monitoring consists of routine daily flock checks and regular scoring of the tipping over the life of the flock. Scoring sheets for infrared treated and hot blade trimmed flocks are in the appendices.

How to select birds for quality of tipping

Select 100 birds at random throughout the shed and assess beak quality to determine the effectiveness of tipping at the nominated times over the life of the flock.

The birds to be scored must be representative of the flock. The process for selecting a random (or representative) sample of birds is as follows.

From cages:

- select cages throughout the house
- select cages from the top, middle, and lower tiers
- ensure cages are selected from both ends of the house as well as the middle
- score all the birds in the same cages every time beaks are assessed.

From a litter and/or slatted floor shed:

- if you have several sheds with birds of the same age, randomly select one shed for sampling
- divide the shed into 10 sections and randomly select 10 birds from each section
- score birds from different locations such as litter area, slatted area, perches and various levels or tiers
- scoring free range birds is easier before they are given access to the range
- if birds are to be scored on the range, score half of the sample in the shed and half on the range
- sample the birds on the range from various locations
- visually assess the beaks of each bird.

It is preferable to do the scoring in the afternoon after the hens have completed lay for the day.

7.4 Scoring of beaks—infra-red treated birds

Infrared beak treated birds are scored at the hatchery using their own or the IRBT machine quality assurance protocol.

The farmer needs to know the chicks have been treated according to the strain characteristics (pecking behaviour and predisposition to pecking), housing and feeding system to be used and farm latitude. The treatment regime will be informed by the effectiveness of previous treatments in minimising the risk of feather pecking.

An example of an industry developed on-farm beak treatment scoring system follows. In this system, birds are evaluated with their beaks in a closed but natural position. The bird is held firmly without applying any pressure on the throat as this may cause the lower beak to draw backwards giving the appearance the lower beak is shorter than it is. Scoring sheets are in Appendix G.

Scoring at 28 days will identify gross treatment errors and unacceptable shapes such as beaks that are non-treated, have a severe hook or a large step (known as shovel beak). The shape of the beak at this age indicates if the prescribed treatment has been applied correctly. This information can also be communicated to the hatchery as part of their continual improvement program.

On-farm regime:

- score the beaks at 28 days of age
- score the beaks of pullets before or at placement in the layer facilities particularly if started pullets are purchased
- score beaks when a bout of pecking occurs or a flock's flightiness increases
- score beaks towards the end of lay if there are concerns about the beak shape even if pecking is not a problem.

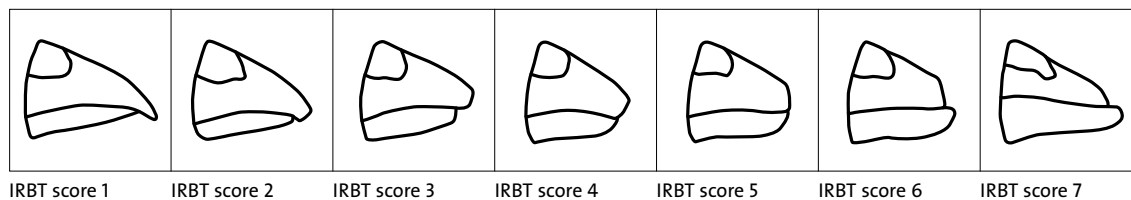
Beak scoring may be able to be combined with other activities, such as on farm vaccination or body weight checks. Scoring beaks after 28 days, particularly if there is a pecking bout provides information about the distribution and presence of acceptable and unacceptable shapes.

The IRBT scoring system is based on a six- or seven-point score method depending on the age of the birds (six-point for hens older than 30 weeks and seven-point for pullets aged 28 days and 12–30 weeks). In 28 day old and 12–30 week old birds the aim is to have 97 per cent of the distribution of beak shapes represented by a score of 3, 4, 5 or 6. Scores of 1, 2 and 7 should represent less than 3 per cent of beak shapes. The step or distance between top and bottom beak should be less than 5 millimetres in score 6 for 12–30 week old pullets and score 5 for hens older than 30 weeks.

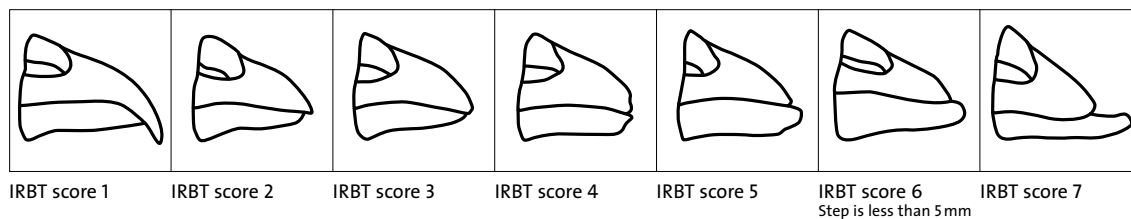
When hens older than 30 weeks are scored 97 per cent of the beak shape distribution should be represented by a score of 3, 4 or 5, while scores of 1, 2 and 6 should represent less than 3 per cent of the beak shapes. The shapes represented in the 97 per cent score are the acceptable or desired shapes that will ensure the bird retains an acceptable beak shape throughout its life.

The distribution of the scores is influenced by the treatment prescription applied. The scores could be entered on a spreadsheet and graphed as a bar chart.

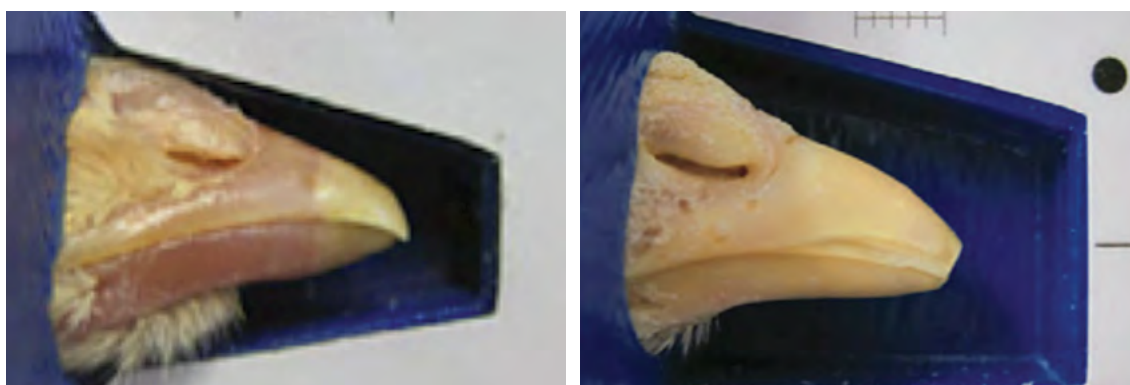
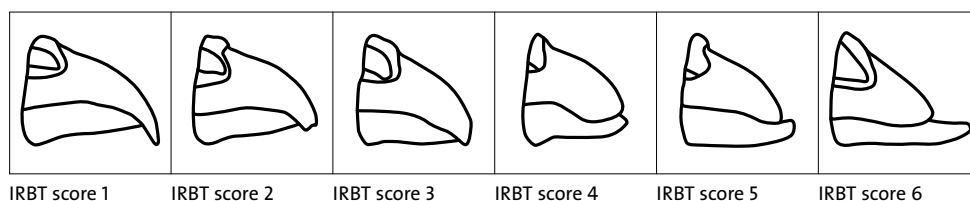
IRBT scoring for birds 28 days old



IRBT scoring for birds 12–30 weeks of age



IRBT scoring for birds older than 30 weeks of age

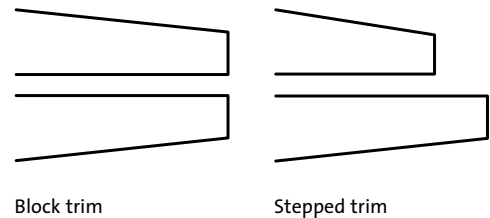


Examples of properly infrared beak treated birds. Left: Chick at day old. Right: Pullet at 17 weeks of age.

7.5 Scoring hot blade trimmed beaks

For all hot blade beak tipping regimes the maximum amount of beak that should be removed is one-third of its length from the nares (nostril opening) to its tip. Removing one-third of the upper beak plus adequate cauterisation time will ensure that regrowth of the beak and neuromas do not occur over the bird's life. If less than one-third of the beak is trimmed it is likely to regrow. If more than one-third of the beak is trimmed there is an increased likelihood of neuromas forming. Properly trained and skilled operators can achieve 90 per cent accuracy when hot blade trimming.

The beak step is the difference in length between the tips of the residual upper and lower beaks. A step between the top and bottom beak makes it more difficult for a bird to get a firm grip on feathers and soft tissues of other birds and reduces the risk of feather pecking and cannibalism.



The stepped beak trim is preferred, however it requires more skill to apply and operators should be properly trained in this technique.

The residual length of a block trimmed beak should be two-thirds of the length of an untrimmed beak. Where a step is requested between the upper and lower beak, the upper beak should be two-thirds of the length of an untrimmed beak and the lower beak slightly longer as listed below.

Where a beak step is requested it should be:

- 1 millimetre when birds are 7–10 days old
- 2–3 millimetres when birds are 10–12 weeks old
- 2–4 millimetres when birds are older than 30 weeks.

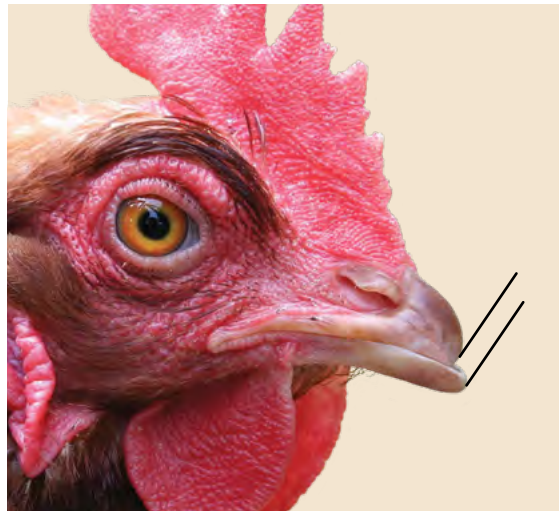
The step should be less than 5 millimetres in birds older than 12 weeks.

The beak length is measured from the outer tip of the nostril or nares to the tip of the beak using either a caliper or dressmakers tape.





Measure the residual beak length from the edge of the external nares to the beak tip for upper beak length as indicated.



Measure beak step from the tip of the upper beak to the tip of the lower beak as indicated.

Hens older than 30 weeks showing persistent cannibalism may need to be re-trimmed to maintain the correct trimmed or residual length of the upper beak (two-thirds of the untrimmed length) and to maintain the correct beak step (2–4 millimetres). Trimming at this age should be done as a last resort to rescue birds from further cannibalism.

Quality assessment or scoring should be done on the day of trim and throughout the life of the flock. Scoring beak shape, length and imperfections can be done in conjunction with other management tasks such as farm vaccination or grading. At least 100 birds from a random sample of birds are assessed.

Suggested scoring regime:

- on the day when trimming is completed
- at 10–14 days after trimming
- prior to, or at, placement of pullets in the layer facilities if purchased as started pullets
- when a bout of pecking occurs or flock's flightiness increases
- towards end of lay if there are concerns about the beak shape and whether it is effectively preventing pecking.

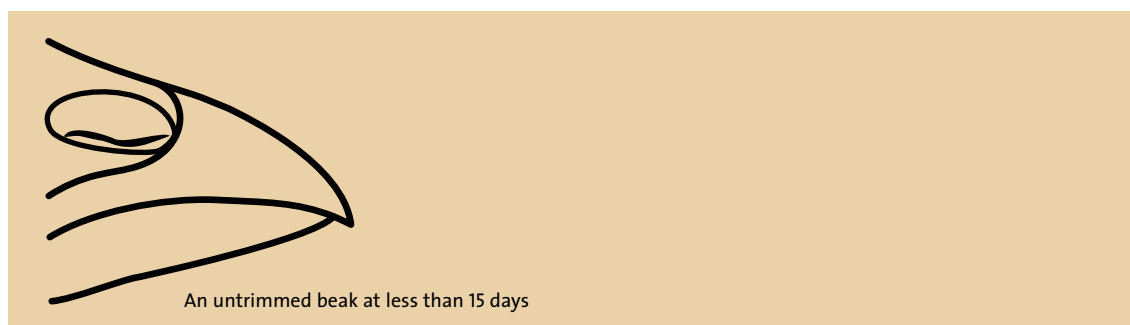
Beak condition deteriorates with age because of how the bird uses its beak. Tears, splitting and chapping develop as the bird interacts with its environment.

An on-farm, quantitative scoring system has been developed where birds are evaluated with their beaks in a closed natural position. The bird is held firmly without applying any pressure on the throat as this may cause the lower beak to draw backwards making the lower beak appear shorter.

Good trimming aims to have:

- ninety per cent (90%) or more of beaks scored with ideal shape and no imperfections
- nine per cent (9%) or fewer of beaks scored with less than ideal shape and minor imperfections
- one per cent (1%) or fewer of beaks scored with poor shape and major imperfections.

Beaks are scored for beak length as well as imperfections. To estimate the residual beak length it is best practice on day of trim to measure the natural beak length of five birds and calculate the average two-thirds residual beak length. As a guide this is 3 millimetres at 7–10 days of age or 7 millimetres at 10–12 weeks of age for current commercial layer strains in Australia.



On the day of hot blade trimming

Ninety per cent (90%) or more beaks should show the following.

1. Residual upper beak is two-thirds or more of untrimmed length
2. Type of trim requested by the farmer has been applied (block or beak step)
3. If a beak step was applied, the step is:
 - a. 1 millimetre if trimmed at 7–10 days
 - b. 2–3 millimetres if trimmed at 10–12 weeks
4. Beak is properly cauterised and there is no bleeding
5. No imperfections, tears, splitting, chapping or swelling of the beak.

Nine per cent (9%) or fewer beaks should show the following.

1. Upper beak is slightly shorter or longer than two-thirds of the length of an untrimmed beak
2. Beak has not been trimmed according to request (i.e. block or beak step)
3. If a beak step was applied, the step is:
 - a. slightly less or more than 1 millimetre if trimmed at 7–10 days
 - b. slightly less or more than 2–3 millimetres if trimmed at 10–12 weeks
4. Beak is not cauterised adequately and may be bleeding
5. Beak shows minor imperfections in appearance (tears, splitting, chapping or swelling).

One per cent (1%) or fewer beaks should show the following.

1. Upper beak is much shorter or longer than two-thirds of the length of an untrimmed beak
2. Big difference in upper and lower beak length
3. Shape is unlike block (straight cut) or block with step
5. Beak shows major imperfections in appearance (splitting, chapping or swelling).



At 10–14 days after trimming

Ninety per cent (90%) or more beaks should show the following.

1. Residual upper beak is two-thirds of the length of an untrimmed beak
2. If a beak step was applied, the step is:
 - a. 1 millimetre if trimmed at 7–10 days
 - b. 2–3 millimetres if trimmed at 10–12 weeks
3. The wound has healed
4. There are no imperfections, tears, splitting, chapping or swelling of the beak
5. There is a good keratin layer on the beak.

Nine per cent (9%) or fewer beaks should show the following.

1. Upper beak is slightly shorter or longer than two-thirds of the length of an untrimmed beak
2. Beak has not been trimmed according to request (i.e. block or beak step)
3. If a beak step was applied, the step is:
 - a. less or more than 1 millimetre if trimmed at 7–10 days
 - b. less than 2 millimetres or more than 3 millimetres if trimmed at 10–12 weeks
4. The wound has not healed and there is presence of dieback
5. The beak shows minor imperfections (tearing, splitting, chapping or swelling in keratin layer).

One per cent (1%) or fewer beaks should show the following.

1. Upper beak is much shorter or longer than two-thirds of the length of an untrimmed beak
2. There is a big difference between upper and lower beak length
3. Shape is unlike block (straight cut) or block with step
5. Beak shows major imperfections (tearing, splitting, chapping or swelling in keratin layer).



At more than four weeks after trimming

Ninety per cent (90%) or more beaks should show the following.

1. Residual upper beak is two-thirds of the length of an untrimmed beak
2. If a beak step was applied, the step is:
 - a. less than 2 millimetres if birds are younger than 10–12 weeks old
 - b. 2–3 millimetres if birds are 12–30 weeks old
 - b. 2–4 millimetres if birds are older than 30 weeks
3. There are no imperfections (tears, splitting, chapping or swelling of the beak)
5. There is a good keratin layer on the beak.

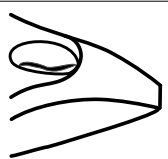



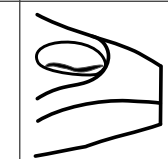

Nine per cent (9%) or fewer beaks should show the following.

1. Upper beak is slightly shorter or longer than two-thirds of the length of an untrimmed beak
2. Beak has not been trimmed according to request (i.e. block with or without beak step)
3. If a beak step was applied, the step is:
 - a. slightly more than 2 millimetres if birds are younger than 10–12 weeks old
 - b. slightly outside the 2–3 millimetre range if birds are 12–30 weeks old
 - b. slightly outside the 2–4 millimetre range if birds are older than 30 weeks
4. Minor imperfections in the beak's keratin layer (i.e. minor cracks, tears, chapping, swelling of keratin layer or minor lack of keratin layer on upper beak tip).

One per cent (1%) or fewer beaks should show the following.

1. Upper beak is much shorter or longer than two-thirds of the length of an untrimmed beak
2. There is a big difference between upper and lower beak length
3. Shape is unlike block (straight cut) or block with step
5. Beak shows major imperfections (splitting, chapping, swelling, splitting or grooving of upper beak or no keratin layer on tip of upper beak).

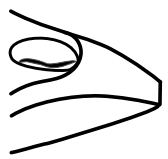
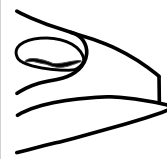
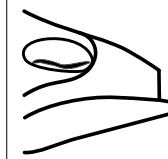

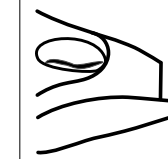

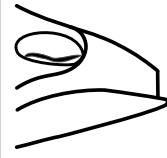



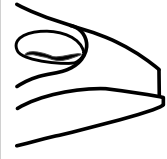
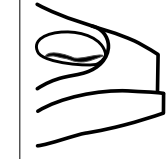
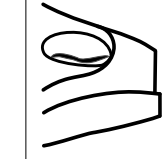
Scoring beak length on day of trim and 14 days after beak trimming—block cut

Score 1 XX	Score 2 X	Score 3 ✓	Score 4 ✓	Score 5 X	Score 6 XX
					
Little or no trim (too long)	Long	Ideal length	Ideal length Slight step	Short length	Too short

Aim for beaks with scores of 3 + 4 to be 90 per cent or more of your sample, scores 2 + 5 to be fewer than 9 per cent and scores 1 + 6 to be fewer than 1 per cent.

Scoring beak length on day of trim and 14 days after beak trimming—step cut

The ideal beak step is not more than 1 millimetre at 7–10 days or 2–3 millimetres at 10–12 weeks.

Score 1 XX	Score 2 XX	Score 3 X	Score 4 ✓	Score 5 XX	Score 6 XX
					
Little or no trim (too long to form a beak step)	Long length Long step	Ideal length Long step	Ideal length Ideal step	Short length Long step	Too short Long step
					
	Long length Ideal step		Ideal length Short step	Short length Ideal step	Too short Ideal step
					
	Long length Short step			Short length Short step	Too short Short step

Aim for beaks with a score of 4 to be 90 per cent or more of your sample, scores 2 + 3 + 5 to be fewer than 9 per cent and scores 1 + 6 to be fewer than 1 per cent.

Scoring beaks four or more weeks after beak trimming














Scoring should take place at the time of transfer to laying facilities and during a feather pecking outbreak.

Scoring at transfer to laying facilities indicates:

- if the standard of the beak trimming (length and shape) is adequate to minimise the risk of feather pecking damage
- how many beaks are too short or too long which can compromise the hen's future welfare and performance.

Scoring at the time of a feather pecking outbreak indicates if the beak shape is adequate to minimise pecking damage.

If birds are purchased as started pullets scoring results should be discussed with the pullet grower.

Score 1 XX	Score 2 X	Score 3 ✓	Score 4 X		Score A XX
 Long length Ideal step	 Ideal length Long step	 Ideal length Ideal step	 Short length Long step		 Neuroma with swelling
 Long length Blunt (no step)		 Ideal length Short step	 Short length Ideal step		 Split or grooved upper beak
		 Ideal length Blunt (no step)	 Short length Short step		 Burnt tongue
			 Short length Blunt (no step)		

Aim for beaks with a score of 3 to be 90 per cent or more of your sample, scores 2 + 4 to be fewer than 9 per cent and scores 1 + A to be fewer than 1 per cent.

7.6 Health problems associated with hot blade beak trimming

Beak imperfections

Farm staff should carefully observe the beak and record any evidence of those that have bulbous growths, splitting, chipping, thin keratinisation (characterised by areas which may be bruised or bleeding), are impacted or show dieback (a dark or gangrenous area of dead tissue on the beak).

Impacted beaks

Impaction of the beak with feed results from the inability of the bird to control the flow of salivary secretions. The saliva causes wetness of the feed, which sticks to the beak causing impaction. This abnormality interferes with eating and drinking, resulting in poor feed efficiency, growth and egg production. Farmers should cull these birds. Note that sunflower meal included in the diet at high levels can stick to the beak and cause necrosis.

Granulation wounds

Following beak treatment or trimming, there is regrowth of the keratin layers in the beak. In some cases, particularly with hot blade treated birds, the keratin layers may not be able to regrow enough for the cut surface to be covered. When this happens, fibrous tissue (softer than keratin) and the overlying epithelial layer abrade and erode leaving a surface that is granulated with a permanent scab. Many birds manage to eat and perform normally with this wound but the open nature of the lesion can provide an entry point for bacteria. This typically produces a local infection manifesting as fibromatous lumps on the face, which when incised contain caseous material (dead matter that looks cheese-like).

Continual low feed levels in troughs can lead to excessive abrading particularly of the lower beak resulting in granulation. The behaviour of some birds following much desired feed particles along chain feeders sometimes causes abrasions on the side of the beak or head and granulation.

Open wounds

In hot blade treated birds, bacteria can enter through the cut and cause an infection if the cauterisation is inadequate. In some cases the type of feeder and drinker can lead to continued irritation of the recently trimmed beak resulting in this area of the beak acting as an entry point for bacteria such as staphylococcus. Poor shed hygiene will also increase the risk of infections.

Infections on the face can occur after bacteria enter through wounds on the beak.



Photo Australian Eggs.

SUMMARY

For all beak tipped birds

- Determine effectiveness of beak tipping by scoring the shape and appearance or condition of the beak.
- Success of beak tipping is reflected by the appearance and shape of the beak after tipping.
- Grade beaks on the basis of imperfections.
- Birds with poor feathering are an indication of poor beak tipping.

For hot blade beak trimmed birds only

- Ideal residual beak length for layers at 10–12 weeks is 12 millimetres for the upper beak with a 2–3 millimetre step (if applied) to the bottom beak.
- Layers and breeders should have a residual upper beak length that is two-thirds of the length of an un-trimmed beak. Where a beak step is required a 2–4 millimetre step to the bottom beak is recommended.
- Infections on the face can occur after bacteria enter through wounds on the beak.

REVIEW ACTIVITIES

- Describe why beak tipping quality needs to be assessed in infrared treated or hot blade trimmed flocks.
- Outline quality assessments for infrared treated and hot blade trimmed birds.
- Describe the indicators of poor beak quality in beak tipped birds.

1. How important is it to assess the quality of the beak tipping over the life of the bird? (Use a cross.)

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Not important

Moderately important

Very important

2. What types of beak tipping quality assessments do you use on your farm?

- Beak length and step measurement for trimmed birds (hot blade or other method)
- Beak shape or profile
- Beak appearance
- Beak score

3. How important is beak appearance? (Use a cross.)

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Not important

Moderately important

Very important

4. Which is the preferred method of beak tipping? Describe why.

- Hot blade
- Infrared

Why _____

5. How do you check that the quality of beak tipping is up to standard?

- Conduct a quick visual assessment of beaks (correct tipping, clean cut, no damage, shape)
- Measure the beak length of a few birds that have been hot blade trimmed
- Score the beaks of 100 birds and work out a percentage accuracy
- Monitor bird behaviour
- Monitor feed and water consumption
- Monitor growth or egg production rate
- Other _____

BEST PRACTICE

- Assess quality of beak tipping using scoring and measurement for beak trimmed birds.
- Monitor feather cover of beak tipped birds.
- Discuss beak quality and length and associated bird performance with hatchery or trimmers throughout the life of the bird.
- Obtain details from the hatchery of the treatment given for IRBT birds.



CAREFUL MANAGEMENT OF BIRDS AFTER BEAK TIPPING
MAINTAINS THEIR WELFARE AND INCREASES LIVEABILITY.
IT IMPROVES FARM PROFIT BY REDUCING PRODUCTION COSTS.

This chapter will help you to implement
best practice management of birds with
tipped beaks throughout their life.



Chapter 8

MANAGING BIRDS WITH TIPPED BEAKS

You should be able to:

- identify the care required for birds during and immediately after beak tipping
- recognise health and production responses of birds with tipped beaks
- implement management practices that ensure birds with tipped beaks achieve maximum production.

8.1 Introduction

Advantages of beak tipping include maintenance of bird welfare, reduced mortality, better feather cover and improved feed efficiency during lay. These advantages can only be achieved with good management, close supervision and monitoring of birds.

8.2 Communication

Where chicks are infrared beak treated it is essential that the farm manager and hatchery manager communicate so the optimum treatment is obtained for the strain of bird being used and the production system they will be raised in. Regular communication throughout the rearing and laying periods ensures both managers are aware of any problems which assists with the management of birds and with any changes to future beak treatment settings.

Managers of the hot blade beak trimming team, and of the farm, should maintain contact in the first week after the operation regarding its success and to ensure there are no problems with the birds. Likewise, hatchery managers responsible for infrared beak treatment should stay in close contact with farm managers to check on the progress of the treated birds.

8.3 Checking birds after beak tipping

Checking birds is an important task, particularly soon after infrared treated chicks have been placed on the farm and on the day of hot blade beak trimming. Regular inspection of the birds is important for the flock's welfare. Compliance with current welfare codes or standards in relation to dead, sick, deformed or injured birds can only be achieved by frequent inspections.

There should be a minimum of four inspections daily over the seven to 10 days following beak trimming.

Behaviour of chickens after infrared beak treatment

Farm managers should observe infrared beak treated chickens at least four times over the day after delivery and record observations in the shed diary.

Behaviour of birds after hot blade beak trimming

Farm managers should observe the birds at regular intervals after beak trimming. Immediately after the trimming birds will be unstable when standing but will start eating and drinking soon after recovering from the initial reaction to the process.

Monitoring

If the flock does not behave normally after infrared treatment or hot blade trimming, the farm manager should ensure there is no aspect of the operation (including equipment and husbandry practices) causing problems for the birds. If there is no obvious reason for the behaviour, the hatchery or a poultry specialist or veterinarian should be consulted.

Appearance of beaks after infrared treatment

When chicks arrive at the farm, infrared treated birds will show a lighter colour on the beak tips indicating that blood flow to these areas has stopped. After two to four weeks the tips of the upper and lower beak will slough off as the bird uses its beak to feed, drink and peck at the environment.

Appearance of the hot blade trimmed wound

The cauterised beak from hot blade trimmed birds will have a light brown colour on the outer edge of the cut and a darker brown colour in the centre of the beak where the blood vessels and bone have been cauterised. There will be evidence of bleeding if the beak has not been cauterised sufficiently.



Chick on the left has **not** been infrared beak treated; while chick on the right has been treated. Note the absence of pink colour in beak tip relative to the untreated chick. These are day olds as delivered on-farm.

8.4 Caring for birds after beak tipping

Eating and drinking after infrared treatment

Infrared beak treated chicks will feed and drink within two hours after placement on the farm. The birds still retain their full beak after treatment and are usually able to eat normally unless an excessive amount of the beak has been treated. Farm managers should make sure that adequate quantities of feed and water are available. Easy access to water in the first seven to 10 days is the key to success with infrared treated birds. It is critical that chickens have access to open water troughs or cup drinkers or 360 degree activated nipples to enable them to drink, eat and grow to reach their full genetic potential.

It is important to monitor feed and water consumption throughout the life of the flock, particularly in the first few weeks after placement on the rearing farm.

Ensure chicks can access feed and water after beak tipping.

Eating and drinking after hot blade trimming

Hot blade trimmed birds will recommence feeding and drinking within two hours. It will take birds several days, or longer, to return to full feed consumption. Farm managers should make sure that adequate quantities of feed and water are available. Poorly trimmed birds will not be able to eat properly while others will waste food either because they cannot pick up the feed or eating is painful. Such birds will only eat to meet their maintenance requirement, grow slowly and produce fewer eggs or may die from starvation if the beak has been severely trimmed. Adequate feed depth in troughs must be maintained for flocks with a large beak step (i.e. longer lower beaks). A shallow feed depth can impair growth or egg production when the hens have long lower beaks.

Hot blade trimmed birds need access to open water troughs for at least 24 hours as they may take time to readjust to nipple drinkers. Water must be deep enough so that birds with a large beak step are able to drink.

Hot blade beak trimming at any age may set a flock of pullets back by two to three weeks because of reduced feed consumption, which will result in lower rate of increase in body weight than expected.

Nutritional supplements

When hot blade trimming is done at any age, supplements can be administered in the drinking water before, during and after the trimming to minimise stress. Supplements include Vitastress™ (1 kg/1000 L water) or Abdextra™ (500 g/900 L water). Use products that will not cause problems such as growth of biofilms in water lines or nipple blockage. Flush the drinker lines using appropriate cleaning agents.

Brooding

Good brooding is essential for birds beak tipped at day old. It is important that the chicks can access suitable feeders and drinkers to help them recover from the operation on their beak.

Brooding plays a major role in producing uniform pullets and minimising the risk of feather pecking and cannibalism later. During the first week of life chicks need extra care. It is important to ensure that temperature, humidity, light intensity, feed and water are optimised. For more information refer to the breeder's management guidelines.

Set up all equipment, including feed and water, the day before chicks arrive. Fill feeders to the highest level with a fresh, good quality starter crumble. Sprinkle additional feed on butcher's paper in the brooding area, but do not cover the entire floor area with paper, as the chicks need to experience litter from the start. Toggle the nipples to ensure they are all working and reduce water pressure to encourage the formation of water droplets on each nipple. Warm up the brooding area 24 hours before the chicks' arrival.

Provide adequate floor, feeder and drinker space as per codes, standards or best management practices as described in the breeder's management guides as long as they are better than the Code. Overcrowding in the brooding areas of any rearing system can result in cannibalism.

Follow the breeder's recommendations for brooding temperature and provide adequate ventilation but avoid draughts on chicks in the brooding area. Relative humidity should be more than 40 per cent to prevent dehydration. Relative humidity below 30 per cent causes agitation in the chicks and leads to aggressive behaviour. Note also that litter becomes damp or wet if relative humidity is above 70 per cent.

Brooding in cages requires an even temperature throughout the shed and strict control of temperature and humidity since chicks cannot move to an area of comfort unlike chicks grown on the floor.

Adding vitamins and electrolytes to the drinking water will help reduce the stress associated with hatching and transport.

For the first three days after arrival provide brighter light (20–30 lux) to assist the chicks find feed and water. Light intensity may then be reduced to as low as 3 lux during rearing.

8.5 Mortalities in beak tipped flocks

Mortality in infrared treated flocks

Some flocks of chicks may have a few birds that are weak and would normally die during the first week irrespective of whether they are infrared beak treated or not. Nevertheless, the body weight of the chicks that die should be recorded and a post-mortem carried out to determine the cause of death. Possible causes for increased mortality are poor brooding set up, incorrect placement on delivery, poor handling of birds, incorrect water system pressure, water condition and drinker type, incorrect lighting levels and regime and inability to easily access feed, water or warmth. The use of vertical pin or bi-direction drinkers can increase chick mortality. Take care to ensure infrared beak treated birds are provided with 360 degree nipple drinkers, open water troughs or cup waterers (not vertical pin nipple drinkers) during the initial weeks of pullet rearing.

If infrared beak treatment is suspected as a cause of increased mortality or poor chick performance discuss your concerns with the hatchery and verify the settings that were used. Factors such as lamp power and beak exposure should be examined by the hatchery and a corrective action plan developed as deemed necessary.

Record mortality after infrared beak treatment. It should not exceed 1 per cent in the first week after treatment or 5 per cent over the life of the flock.

Mortality in hot blade trimmed flocks

If beak trimming is suspected as a cause of increased mortality or poor growth and performance of birds, the beak trimming process should be examined and action taken to reduce the problem. Possible causes for increased mortality are poor handling of birds before and during the procedure, excessive bleeding, over- or under-cauterisation, severe beak trimming and the inability of birds to easily access feed and water.

Record mortality after hot blade beak trimming. It should not exceed 1 per cent in the week after hot blade trimming or 5 per cent over the life of the flock.

Culling birds

For the overall welfare of birds it is important to identify those that should be culled and humanely kill them straight away. Neck dislocation is an acceptable method of humane destruction provided it is carried out competently. It is a practical method and quickly results in death.

An experienced farm manager can easily decide which birds should be culled. Birds of all ages should be culled if they appear very weak or unable to move and are not likely to survive.

8.6 Long-term success of beak tipping

The long-term success of the infrared beak treatment or hot blade beak trimming program depends on how well the beak recovers from these methods and the resultant appearance of the beak at various stages during the life of the bird. Birds should perform to their maximum potential with no evidence of reduced feeding or drinking ability, or cannibalism. Farm managers should review the quality of the beak tipping by assessing the birds at the nominated times after tipping before or at transfer if started pullets are purchased, and at the start of a bout of increased pecking if it occurs during the rearing or laying period, and towards the end of lay if there are concerns about the beak shape even though pecking is not a problem.

Uneven flock development

When beak tipping is not done consistently, the flock develops unevenly which affects growth and subsequent egg production. Some birds come into lay earlier than others, and egg weight and other production parameters may vary. Grading birds into similar weight groups during rearing can assist them achieve the same rate of development.

Good managerial skills and close supervision are required when looking after beak tipped birds and applying a weight management program.

8.7 Production responses of beak tipped birds

Mortality

While pullet mortality in sheds with controlled light is generally unaffected by beak tipping, laying shed mortality is less in beak-tipped flocks than in non-tipped flocks. Mortality of flocks from cannibalism with shorter beaks is generally lower than in flocks with longer beaks.

Feed intake and body weight

In the growing period feed intake and body weight of infrared beak treated birds are usually higher than hot blade trimmed birds. In the first two weeks after trimming the feed intake and body weights are lower in birds that are hot blade trimmed at five to 10 days of age compared to those that are trimmed at six weeks of age.

For adult hens receiving their first hot blade trimming at 30 weeks of age, removal of 4, 6 and 8 millimetres of the upper beak using a block cut causes a decrease in feed intake and body weight. However, when only 3 millimetres of the beak is trimmed, feed intake is only decreased for a short period, with intake recovering to normal levels within two weeks. A moderate block beak trim of 2 millimetres in adult hens at 30 weeks of age does not affect feed intake.

Beak trimming of birds just before, during and immediately after peak lay and peak egg mass is likely to affect egg production rate or egg mass due to the stress of handling or trimming.

Feed efficiency

Beak tipping reduces feed usage and body weight during rearing and lay, especially if birds are re-trimmed. If birds are not beak tipped and have adequate feeding space and stocking density, some strains may need to be subjected to a body weight management program to regulate excessive body weights. However, restricting feed to improve efficiency and control body weight may not improve wellbeing if hungry birds increase pecking leading to cannibalism or show any other deleterious physiological or behavioural responses. Good managerial skills and close supervision are required when birds with tipped beaks are being feed restricted.

Feed efficiencies of both infrared treated and hot blade beak trimmed birds are better than non-tipped birds. Feed wastage has been suggested as one possible reason for the increased feed usage in non-tipped birds. Feed usage, which includes feed consumed and wasted, can be about 15 per cent higher for non-tipped birds. In both infrared treated and hot blade trimmed flocks better feather cover leads to better feed efficiencies partly due to the decrease in energy requirements for maintenance of body temperature. (Feathers insulate the bird and reduce the feed required to keep it warm.)

Feather cover

Feather cover is better in both infrared treated and hot blade trimmed birds probably because of reduced feather pulling and pecking. Beak trimming that results in two-thirds of the upper beak remaining during rearing will improve feather cover of adult hens. If feather pulling and pecking persists check to see if beak regrowth has occurred and re-trim birds so that two-thirds of the upper beak remains throughout the life of the birds. Floor-reared (litter and/or slats) and cage reared birds have better feather cover as a result of beak tipping.

Age at maturity

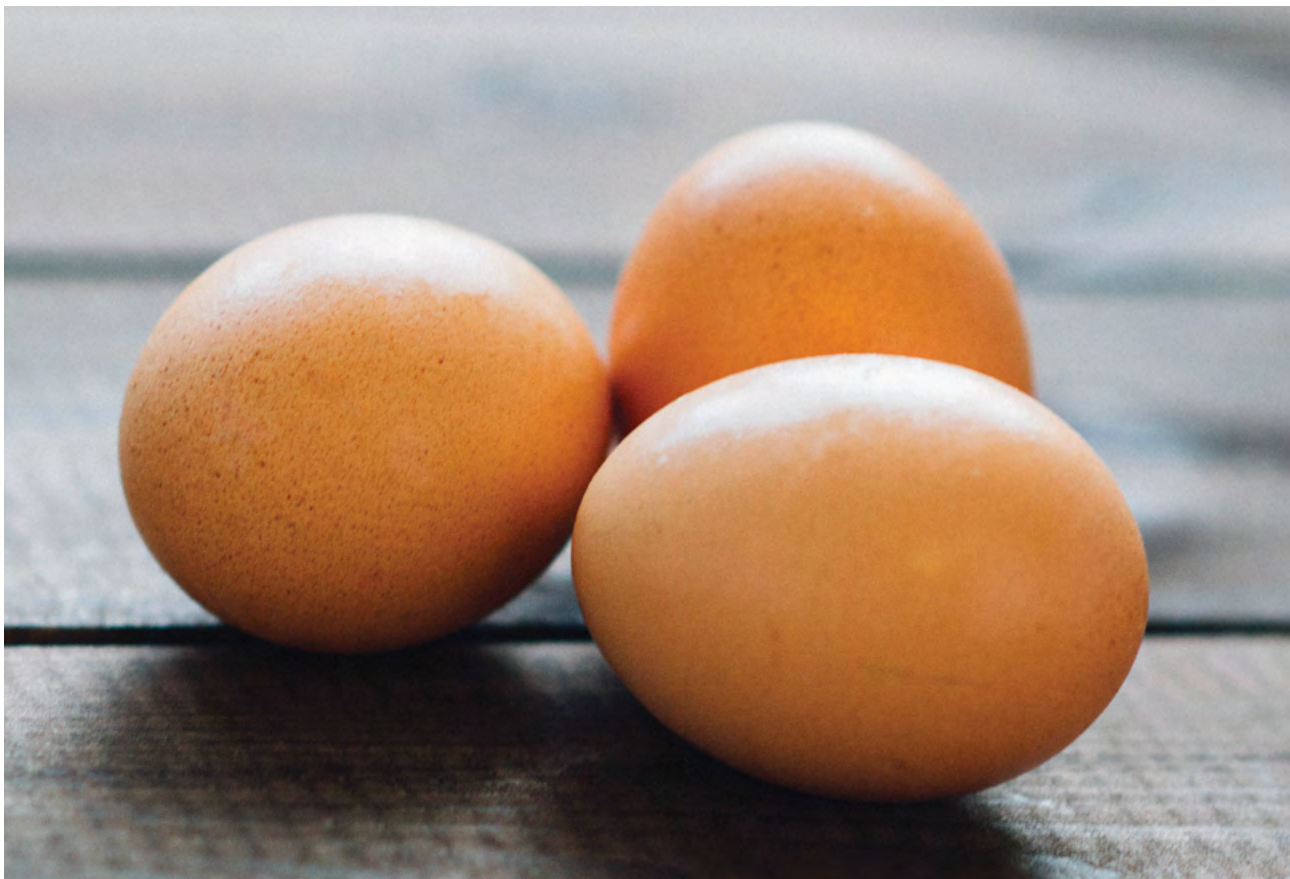
Both infrared and hot blade trimmed birds experience a short delay in sexual maturity. An exception is with severe tipping which results in a two week delay in sexual maturity. However the short delay in maturity caused by moderate infrared treatment and hot blade trimming does not affect total egg production.

Egg production

Moderate beak treatment at day old results in seven more eggs per hen housed compared to non-tipped birds, while trimming with a hot blade at nine days old results in four more eggs per hen housed relative to non-tipped birds. Reduction in egg production can occur when 18 week old pullets are subjected to a severe hot blade trim. Birds with grossly short beaks generally produce at a lower rate.

Egg quality and weight

Beak tipping does not affect shell thickness, incidence of blood spots or albumen height. Egg weight is generally not affected by beak tipping, though there can be a decrease in egg weight when hot blade beak trimming is done at day old.



8.8 Re-trimming

When there is substantial regrowth of the beak after either infrared treatment or hot blade trimming, pullets need to be re-trimmed using the hot blade at 10–12 weeks of age to prevent feather pecking and cannibalism. There is also an added advantage of reducing feed wastage. Sometimes the re-trim needs to be done when the birds are as young as five weeks. Re-trimming is more likely to be required when the initial hot blade trim is performed at day old or five to 10 days of age and signs of excessive pecking are evident later on. A second trimming of the beak is more permanent since it reduces regrowth of the beak.

Avoid retrimming by ensuring the treatment or first trim is correct for the environment into which the birds will be placed and the flock is managed to minimise the risk of severe pecking.

At 10–12 weeks, beak tipping is more costly to perform and imposes greater stress on the birds through pain and handling from the trimming. This leads to a reduced feed intake. All birds should be checked at this age to decide if re-trimming is required. Whenever beak tipping is contemplated, the timing should be such that it does not coincide with the application of other husbandry practices that may stress the bird (e.g. moving pullets to laying facilities).

Re-trimming birds that do not need it can affect their welfare and future performance. Birds re-trimmed lightly at 17 weeks of age have a delay in sexual maturity that leads to carry-over effects into the egg production period. Do not re-trim older pullets and hens that have gross lesions on the beak. These birds should be culled.

8.9 Benefits of beak tipping

Advantages of beak tipping include reduced mortality from feather pecking and cannibalism, better feather cover, improved feed efficiency during lay and improved long-term welfare. Moderate beak tipping at a young age does not affect subsequent egg production and quality. Beak tipping reduces feed usage and results in lower body weight during rearing and lay. Feed costs represent a significant proportion of the total cost of production. If birds are not beak tipped and have adequate feeding space and stocking density, some strains may need to be subjected to mild feed restriction to reduce excessive body weights.

In addition, the wellbeing of the farmer or manager is improved because they do not have the ongoing stress of waiting for another pecking attack and its potential to cause financial loss.



Photo Australian Eggs.

SUMMARY

- Observe the behaviour of beak tipped chickens at regular intervals.
- Easy access to water is essential during the seven to 10 days after treatment or trimming.
- Check birds four times daily for one week after the operation or after placement.
- Cannibalism can be initiated if bleeding occurs after hot blade beak trimming.
- Determine effectiveness of beak trimming by measuring beak length.
- Cervical dislocation is the most practical method for culling birds.
- Poor beak tipping results in food wastage, starvation and uneven flock development.
- Record mortality in the first after beak tipping. It should not exceed 1 per cent.
- Record mortality from cannibalism over the life of the flock. It should not exceed 5 per cent.
- Bird performance, feather cover and the appearance of the beak reflect the success of beak tipping.
- A flock with poor feathering is an indication of poor beak tipping.
- Infections on the face can occur after bacteria enter through wounds on a severely hot blade trimmed beak.

REVIEW ACTIVITIES

1. What management practices do you use after beak tipping to maximise bird welfare and production?

Shorter term

- Ensure feed and water is readily available
- Ensure nipples are of the 360 degree activated type
- Add extra feed to ensure birds do not hit trimmed beak on the bottom of the feeder
- Change the lighting according to birds' needs
- Ensure brooding/shed conditions and temperature are optimal
- Cull birds of ill-health
- Other _____

Longer term

- Monitor feathering
- Monitor beak length and shape
- Monitor health problems, mortality and culls
- Monitor pullet body weight and uniformity
- Monitor production responses e.g. egg weight, feed intake and egg production.

2. What checks do you make of bird performance?
- Pullet live weight
 - Pullet uniformity
 - Hen body weight
 - Egg production
 - Feed intake
 - Egg weight, egg grades and cracked eggs
 - Mortality and culls.
3. Do you monitor, record and discuss the on-farm results of beak tipping with the hatchery or trimming team manager?
4. What checks do you share with the hatchery about the birds and facilities on your farm?
- Mortalities and body weight of dead and culls in first 10 days after beak tipping
 - Mortalities and culls 10 days after beak tipping
 - Beak length
 - Beak quality
 - Light intensity in the house
 - Feed particle size, water availability, drinker type, feed equipment, feed depth, ventilation, stocking density, water quality
 - Farm tidiness, presence of rodents, etc.
 - Chick behaviour
 - Brooding temperature and conditions.

BEST PRACTICE

- Make regular checks of beak shape and trimmed length throughout rearing and lay.
- Assess production performance, feather cover, bird behaviour and health throughout the rearing and laying period.
- Ensure feed and water is readily available and environmental conditions (lighting, ventilation, temperature) are ideal during and after beak tipping.
- Keep records of bird mortalities, culls, light intensity, feed form, ventilation, stocking density, water quality and bird behaviour after beak tipping.
- Discuss beak quality and length and associated bird performance with hatchery or trimmers throughout the life of the bird.

BEAK TIPPING CAN CAUSE PAIN TO BIRDS BUT PREVENTS DEATH FROM CANNIBALISM.

This chapter will help you to understand the welfare issues involved in beak tipping.

Chapter 9



WELFARE OF BIRDS WITH TIPPED BEAKS

You should be able to:

- identify different points of view concerning beak tipping
- identify the current welfare code or standards or the future Welfare Standards and Guidelines requirements that apply to beak tipping
- identify the role that training can play in maximising bird welfare.

9.1 Introduction

The welfare of birds during beak tipping and the potential negative long-term effects of the procedure are becoming increasingly important to consumers. Standards for beak tipping were introduced into the poultry industry to ensure the practice of beak tipping was consistent and did not compromise the welfare of birds. The standards developed are the minimum requirements expected to produce quality beak tipping, and higher standards are often achieved by industry. It is the farmer's responsibility to ensure the standards for beak tipping defined in the current welfare code, standard or guideline are adhered to.

When birds are not beak tipped, increased incidences of morbidity and mortality will occur due to cannibalism. Welfare problems associated with cannibalism can be devastating.

When performed correctly to industry standards, beak tipping has advantages. These include reduced:

- feather pecking
- mortality
- vent pecking and prolapse
- bullying
- stress on the bird
- feather loss or areas of bare skin.

When beak tipping is not done correctly, birds can suffer from:

- reduced ability to eat and drink
- short- and long-term stress
- reduced social status
- feather pecking and cannibalism.

9.2 Beak tipping in Europe

In 1965 the Brambell Committee in the United Kingdom recommended that beak trimming should be banned within three years. However beak trimming is still used extensively worldwide although it has been banned in some European Union countries. In Germany, the Animal Welfare Law (1998) states that beak trimming is an amputation, is a painful method for poults and impairs function of the beak. However, it can still be performed if the intervention is indispensable for the protection of the animals, provided persons with expert knowledge and skills carry out the procedure.

United Kingdom amendments to the RSPCA's Freedom Food Welfare Standards in 2003 stated their intention to move away from any beak trimming within five years and that beak trimming would not be permitted after 2015. A Beak Trimming Action Group (BTAG) was established in the United Kingdom in 2002 and they wanted the ban implemented in 2011. The group is comprised of representatives from industry, welfare groups, veterinarians, academics and government. The government postponed the ban until 1 January 2016. During the period leading up to 2016 BTAG looked for ways in which the practice of beak trimming could be brought to an end without impacting on other animal welfare issues.

In 2015, BTAG submitted a review of evidence for the possible ban on beak trimming in 2016, advising that the risks of introducing a ban on infrared beak trimming are too great as it could result in significant welfare problems through outbreaks of feather pecking and cannibalism, and the use of emergency beak trimming using the hot blade method. This is a far worse outcome from an animal welfare perspective.

The government accepted all BTAG's recommendations and said that a proposed ban on beak trimming would not be introduced in the United Kingdom from January 2016.

The BTAG review found that although countries such as Austria and Sweden have implemented bans on beak trimming, the United Kingdom's larger flocks and different breeds mean lessons learnt from these countries are not easily transferred.

The BTAG said that halting the proposed ban should just be an ‘interim step’ and that in future it will be possible to avoid widespread beak trimming. Further research is being undertaken to discover what factors trigger severe pecking and cannibalism, and what management strategies can reduce severe pecking.

The BTAG review also identified improved management techniques that could reduce feather pecking and the government expects to see these techniques introduced across the laying hen sector.

Where beak tipping is practiced in the United Kingdom legislation allows the removal of up to one-third of the upper beak using the infrared beak treatment method if there is a problem with cannibalism in the strain. The hot blade technique cannot be used.

9.3 Beak tipping in Australia

In Australia the Agricultural Resource Management Council of Australia and New Zealand (ARMCANZ, now PIMC [Primary Industries Ministerial Council]) passed a resolution in 2000 that required the poultry industry to develop a national accreditation program for beak trimming as a component of the Model Code of Practice for the Welfare of Animals–Domestic Poultry (Welfare Code). As a result the egg industry developed a training manual that defines acceptable standards. These standards include how to conform to biosecurity requirements, set up equipment, handle birds, trim the beak of chickens and assess the quality of the beak trimming. The current training manual will be updated following the release of this handbook.

It is a requirement that all beak trim operators are accredited.

9.4 Welfare views

Some people consider that beak treatment and trimming are a last-ditch measure to avoid the consequences of aggressive behaviour in birds resulting from bad management, high stocking densities, poor diets and high light intensities. They indicate that birds suffer a setback in growth and development as they recover, and the pain caused during trimming reduces production, particularly from beak tenderness that makes it difficult for the birds to eat. There is also a concern that trimmers show insufficient care with some chicks suffering shock, burnt tongues and other facial injuries.

Welfare groups consider that beak trimming is a consequence of commercial farming of poultry.





9.5 Industry views

Many poultry farmers believe that, on balance, the practice of beak tipping is essential, provided the operation is performed properly. A second trim is often needed, particularly for birds housed in free range production systems. When an outbreak of cannibalism occurs in the flock it is essential that a hot blade trim be performed immediately to prevent further mortality.

Poultry farmers believe that beak tipping prevents death from cannibalism.

9.6 Changes in the beak after tipping

The beak is essential for birds to pick up feed particles, explore their environment, and to preen and defend themselves. The beak surface contains structures that play an important role in enabling birds to discriminate between various food sources. Hot blade trimming results in the removal of sensory receptors with a subsequent reduction in feed intake, pecking efficiency, drinking ability, loss of some temperature and touch responses and occasionally behaviours indicative of persistent pain. Birds can become passive when two-thirds of the beak is removed with a hot blade. In birds that have short-tipped beaks, dry mash tends to block their nostrils, and they are unable to clean out the food trough.

9.7 Pain after beak tipping

Following beak tipping, birds experience three phases (painless, acute pain and chronic pain) that are similar to the pain humans experience after an injury. The painless phase occurs soon after injury and can last from several hours to more than 24 hours. The injured nerves lose their ability to transmit signals to the brain. The brain also releases analgesics (endorphins) that can mask the pain.

In the acute pain phase, beak-tipped birds adjust to the injury. The acute pain results from activation of pain receptors resulting from damage to the beak and nerve injury. The receptors send signals to the brain causing the feeling of pain. This phase can last a few minutes, hours or even days. In most cases the acute pain lasts a few days to a few weeks. Acute pain is generally self-limiting and as the stimulus lessens, the pain decreases.

The chronic pain phase occurs when birds experience pain for a long period after the beak has healed. In humans a small number of patients experience chronic long-term pain following amputation. Some birds trimmed with the hot blade will suffer chronic pain. The infrared beak treatment method does not result in chronic pain as a minimal amount of the beak is treated.

Neuromas

A neuroma is a tangled mass of nerves that grows after a nerve has been cut. Neuromas form in the beak stump after tipping and it is suggested that they are the cause of chronic pain. Several weeks after a neuroma forms the tangled nerves start to breakdown taking at least 10 weeks to repair. Occasionally the mass of nerves does not degenerate and can give off signals that are felt as chronic pain. Scientists are still to determine if all neuromas that form in the beak cause chronic pain.

Neuromas will form irrespective of the age when birds are beak tipped but have a greater potential to dissolve if chicks are hot blade trimmed early in life. Research shows that birds infrared beak treated at day old and hot blade re-trimmed lightly at 12 weeks do not have feeding or pecking behaviours that indicate they are suffering severe chronic pain.

9.8 Comparison of infrared beak treatment and hot blade trimming

In hot blade trimming, the age of the bird and the severity of trimming are major risk factors for bird welfare.

Poor equipment set up and operator error can result in excessive trimming and bleeding from the beak. Excessive trimming can impair beak function and cause chronic pain associated with persistent neuromas. Operator error can also mean that an insufficient amount of the beak is trimmed which can result in beak regrowth and an increased risk of pecking-related injuries occurring in the flock. Physical damage can also be done to the bird if it is handled roughly.

The other major risk factor for hot blade trimming is the age at which it is performed. It is the only commercially available method for re-tipping birds at present. When older birds are beak trimmed there is a greater likelihood that neuromas will form and result in prolonged chronic pain. It is recommended that when hot blade trimming is necessary, it is carried out in poultry at a young age, preferably during the first week after hatching. A concerted effort should be made to trim no more than one-third of the beak tip and to ensure that operator error is kept to a minimum. Strictly adhering to this recommendation can eliminate extended periods of functional loss, scar tissue, neuromas and misshapen beaks.

The infrared treatment method of beak tipping has recently been widely adopted in the egg industry. The advantage of this method is that it is performed on chicks soon after hatch in a biosecure environment and avoids the degree of human error associated with the hot blade method.

To achieve consistent treatment the newly hatched chickens need to be uniform in size. This is achieved by managing breeders so that body weight is uniform, setting good quality eggs within the acceptable weight range and by segregating eggs by donor flock age so that the treatment given to hatchlings from young and older donor flocks can be matched to their size.

The infrared method is a more welfare friendly means of beak tipping. It is more effective at reducing beak regrowth and results in significantly fewer abnormal deviations in upper-to-lower beak length. It has been shown that when birds are treated using the current industry practice, infrared beak treatment does not result in chronic pain or other adverse consequences for sensory function. The infrared process allows adjustment for differences in strain, bird hydration levels, beak pigmentation, cranial size, beak shape, top and bottom beak symmetry and the environment into which the birds will be placed.

9.9 Training of beak tipping operators

The skill of the operator is important in determining the welfare of beak treated and trimmed birds. By using best practice methods, trained and experienced infrared treatment staff in the hatchery and hot blade trimming team will minimise welfare problems resulting from incorrect beak length. A poorly-trained, less-experienced operator who does not use best practice is likely to be the source of problems that could be avoided.

Training is largely carried out on the job where experienced operators provide guidance and supervision to those new to the task. Skills are taught and knowledge imparted so that a new trainee can learn how to beak treat or trim, as well as know why they need to do things a certain way. The other vital component of learning is for trainees to gain a caring attitude towards the birds they work with so that bird welfare is maximised.

*Do you know how well trained the beak treatment or trim operators you use are?
New beak treatment and trimming operators are required to have adequate
knowledge, skills and good attitudes to meet standards.*

9.10 Beak tipping accreditation

It is a requirement in the Welfare Code that beak trimming must be performed only by an accredited operator or under the direct supervision of a qualified trainer as part of an approved training program and must be performed only in accordance with agreed standards.

Accreditation will ensure people carrying out beak trimming meet the standards for quality management systems required in the hatchery and on the farm. Operators will be required to have their skills and knowledge formally assessed against a national competency standard supported by the poultry industry. Once they demonstrate their competence they will meet the accreditation requirements in the Welfare Code.

Australian Eggs will make available a training program to enable accreditation or reaccreditation of hatchery, farm and contractor personnel undertaking hot blade trimming.

Hatcheries using infrared beak treatment equipment have a training and assessment standard provided by the vendor included in their quality assurance program. The program ensures that hatchery and staff administering treatment to chickens meet a high standard of application and welfare.

Contact Australian Eggs for further information about accreditation.

SUMMARY

- Some welfare groups consider beak tipping is used as insurance against bad management.
- Farmers believe that beak tipping prevents pain and suffering in birds from severe pecking and cannibalism.
- The beak is essential for picking up feed particles, preening and for defence.
- Birds experience three pain phases after tipping—pain free, acute pain and chronic pain.
- Neuromas are suggested as the cause of chronic pain.
- Beak tipping correctly at day old leads to normal feeding and behaviour.
- Beak tipping has been banned in some European Union countries.
- In the United Kingdom, the Beak Trimming Action Group indicated that halting the proposed 2016 ban on beak tipping was an ‘interim step’, and in future, it will be possible to avoid widespread beak tipping with further breeding of low feather pecking breeds and other tools.
- In Australia, the Primary Industries Ministerial Council required the poultry industry to develop a national accreditation program for beak trimming.
- Beak tipping training in Australia is intended to be carried out on-the-job.
- The workplace trainer’s role is to train suitable employees so that they can beak treat or trim chicks, pullets and laying hens according to industry standards.
- The trainee’s role is to learn on-the-job to acquire the necessary knowledge, skills and attitudes so that they reach the industry standards.
- Assessment is a process that checks that someone is competent to carry out a skill.



REVIEW ACTIVITIES

1. Use the following scales to:

- Identify the level of welfare concerns relating to beak tipping. (Use a circle.)
- Identify the level of welfare concerns relating to cannibalism. (Use a cross.)

You

--	--	--

No concern

Some concern

Major concern

Other farmers

--	--	--

No concern

Some concern

Major concern

Welfare groups

--	--	--

No concern

Some concern

Major concern

Community

--	--	--

No concern

Some concern

Major concern

2. Do you have access to the current poultry welfare code, standard or guidelines?

Yes No

3. Have you been involved in any training related to:

Beak tipping Yes No

Quality assurance Yes No

Management of poultry Yes No

BEST PRACTICE

- Consult the relevant welfare code, standard or guidelines to determine the standards required for the age of bird to be beak tipped.
- Use appropriately trained infrared beak treaters and accredited hot blade trimmers who have a proven reputation in the industry.

Appendix A



MONITORING AND MANAGING POULTRY TO MINIMISE FEATHER PECKING AND CANNIBALISM

A checklist for farm managers to use when there is evidence of feather pecking or cannibalism in a flock or as a check of farm practices for managing disruptive stressors to minimise the risk of occurrence of feather pecking. Most of the items to be checked should be included in daily or other checklists used as part of the farm quality assurance program.

Welfare codes, standards or guidelines place responsibility on the farm owner, manager and staff to minimise feather pecking and cannibalism in poultry flocks under their care.

Place a tick as applicable in the left hand box.

Monitor bird behaviour and pecking	
<input type="checkbox"/>	Staff walk through the flock calmly, quietly and consistently.
<input type="checkbox"/>	During peak egg production and peak egg mass.
<input type="checkbox"/>	Following periods of disturbance from vehicles and other farm noises and events.
<input type="checkbox"/>	Following vaccination or other procedures on the flock.
<input type="checkbox"/>	If there are changes in staff tending to the flock or when visitors enter the shed.
<input type="checkbox"/>	During variable weather conditions (high temperature/humidity/wind/storms).
<input type="checkbox"/>	While eggs are being collected.
<input type="checkbox"/>	During routine cleaning and maintenance in the shed.
<input type="checkbox"/>	When the egg belt and manure belt are being run.
<input type="checkbox"/>	When wild birds, reptiles or rodents get into shed or when birds escape from cages.
<input type="checkbox"/>	When hens are moved to another cage.
<input type="checkbox"/>	When light intensity is increased or length of light period is changed.
<input type="checkbox"/>	When birds are moved from controlled light housing to uncontrolled (natural) lighting.
<input type="checkbox"/>	Following husbandry mishaps such as breaks in feed or water supply or light failure.
Stocking density	
<input type="checkbox"/>	Recommended stocking density is used in cages, barn sheds and free range systems.
<input type="checkbox"/>	Stocking density is reduced if pecking is a problem.
Body weight	
<input type="checkbox"/>	Body weight is checked regularly to meet breeder guidelines.
<input type="checkbox"/>	The flock is uniform in weight.

Place a tick as applicable in the left hand box.

Diet	
<input type="checkbox"/>	Diet is optimum for growth or production stage of bird and housing system.
<input type="checkbox"/>	Mash is fed to increase foraging behaviour and reduce feather pecking.
<input type="checkbox"/>	Ration changes are made gradually.
<input type="checkbox"/>	Dietary fibre is 3.5–4.0 per cent.
Litter	
<input type="checkbox"/>	Litter is clean, dry and friable and the appropriate depth.
Enrichment	
<input type="checkbox"/>	Non-cage shed floor is enriched with scratch grain, straw bales, pecking blocks, etc.
<input type="checkbox"/>	The range is enriched with windbreaks, shelterbelts, crop rotations, shade and sand baths.
<input type="checkbox"/>	Birds are introduced to enrichment devices during pullet rearing.
Abrasives	
<input type="checkbox"/>	An abrasive material is fixed to the base of non-chain feed troughs.
<input type="checkbox"/>	Abrasive material is fitted to non-perforated egg baffles of cages.
<input type="checkbox"/>	Claws are checked for bluntness.
Parent stock	
<input type="checkbox"/>	Chicks sourced from different breeder or donor flocks are reared in separate groups.
<input type="checkbox"/>	A strain with low levels of cannibalism is selected.
<input type="checkbox"/>	A strain with short claws is selected.
Brooding	
<input type="checkbox"/>	All birds are able to access food and water.
<input type="checkbox"/>	Drinker and feeder height is correct.
<input type="checkbox"/>	Litter material is dry at chick placement.
<input type="checkbox"/>	Vitamins and electrolytes are given in drinking water.
Rearing management	
<input type="checkbox"/>	Birds are housed in similar facilities from day old to end of lay.
<input type="checkbox"/>	Perches are provided during rearing.
<input type="checkbox"/>	Shed equipment runs quietly.
<input type="checkbox"/>	Recommended feeding and drinking space is available to each bird.
<input type="checkbox"/>	Sick and unthrifty birds are culled.
Pullet transfer	
<input type="checkbox"/>	Pullets are moved to the laying house at 15–17 weeks.
<input type="checkbox"/>	Vitamins and probiotics are provided in the drinker water three days before and after placement.
<input type="checkbox"/>	Birds are transported at night to keep them calm.
<input type="checkbox"/>	Extra feed and water is provided soon after placement.

Place a tick as applicable in the left hand box.

Prelay hens in cages	
	Laying house temperature is the same as the rearing shed at time of transfer.
	Light intensity is increased for seven days after placement.
	Pullets are fed a pre-lay diet until first egg is laid.
Prelay hens in barn and free range	
	Birds are not disturbed when first placed.
	Lights are left on for 24 hours after placement.
Layer hens in cages	
	Monitor feed intake, body weight, egg weight and egg numbers throughout lay.
	Pullets are not stimulated with light until breeder target body weight is achieved.
	Monitor feather cover throughout lay.
	Maintain correct stocking density.
	Ambient temperature in layer shed is 18–27°C
	Provide adequate ventilation at all times.
	Old fluorescent tubes are replaced as the light pattern emitted during flickering becomes asymmetrical with age and is likely to induce feather pecking.
	Keep light intensity at 5 lux with a minimum of 0.5 lux at feeder level in controlled environment sheds.
Layer hens in non-cage facilities	
	Provide sufficient substrate to enable birds to carry out regular comfort behaviours (resting, sleeping, preening, scratching and dust bathing).
	Monitor body weight and uniformity by weighing birds regularly.
	There is even light intensity in shed.
	Birds are socialised by stock attendants walking through the shed at least four times daily soon after placement.
	When pecking is a problem stocking density is reduced.
	Strains of layer hens are suited to non-cage housing.
	Laying facilities match rearing facilities.
	Floor eggs are picked up regularly and consistently.
	Birds are protected against climate extremes.
	Non-cage birds are regularly treated for internal parasites.
	Birds are protected against disease using an appropriate health and vaccination program.
Range management	
	Birds have easy access to and from the range.
	Pullets are introduced to the verandah or range at 18–20 weeks (five per cent production) or after peak egg mass.
	Pullets introduced to the verandah are given access to the range one week later.

Place a tick as applicable in the left hand box.

Lighting	
<input type="checkbox"/>	Pullets for free range egg production are reared with exposure to natural light.
<input type="checkbox"/>	Low light intensity (3–5 lux) is used from three weeks to transfer in controlled environment sheds.
<input type="checkbox"/>	Controlled environment shed is light proofed to avoid outside light leaking in.
<input type="checkbox"/>	Sunlight does not illuminate the floor and nest boxes in naturally ventilated housing.
<input type="checkbox"/>	Sudden increases in light intensity and photo period (or day length) are avoided.
<input type="checkbox"/>	Abrupt shifts in light intensity between shed, verandah and range are reduced.
<input type="checkbox"/>	In naturally ventilated sheds light intensity is 10–15 lux from four to six weeks of age through to 14 weeks and increased to daylight levels that the birds will experience in the shed during lay.
Nest boxes	
<input type="checkbox"/>	Hens can freely access nest boxes.
<input type="checkbox"/>	The entrance to the nest is well lit.
<input type="checkbox"/>	The interior of nest boxes is darkened.
<input type="checkbox"/>	Individual nest boxes or nesting areas are not overcrowded.
Bird health	
<input type="checkbox"/>	Unthrifty, small, odd coloured and pariah birds are culled.
<input type="checkbox"/>	Dead birds are removed daily.
<input type="checkbox"/>	Flock is treated for internal parasites and ectoparasites.
<input type="checkbox"/>	Birds treated for wounds are separated from the flock.
<input type="checkbox"/>	Predators, rodents and flies are controlled and wild bird entry into sheds is prevented.
<input type="checkbox"/>	Birds with vent trauma or wounds from cannibalism are treated or culled.
Daily health and welfare checks	
<input type="checkbox"/>	Bird behaviour is normal (stance, flightiness, sounds).
<input type="checkbox"/>	Mortality is normal.
<input type="checkbox"/>	There is no overcrowding.
<input type="checkbox"/>	Bird stress is minimised.
<input type="checkbox"/>	Feed and water is available to all birds and consumption is normal.
<input type="checkbox"/>	Litter is dry and friable and there are no wet patches in the litter.
<input type="checkbox"/>	Ventilation is adequate at all times.
<input type="checkbox"/>	There is no smell of ammonia.
<input type="checkbox"/>	There is no excessive dust.
<input type="checkbox"/>	Ventilation and shed temperature are ideal.
<input type="checkbox"/>	Light is uniform throughout the shed.
<input type="checkbox"/>	Alarm systems are working.
<input type="checkbox"/>	Cooling and heating systems are working.

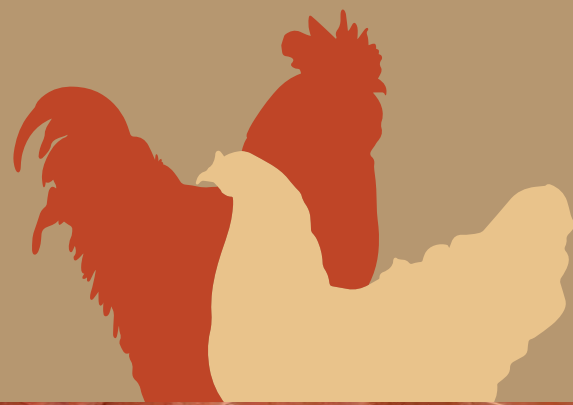
Farmers and breeder managers are also encouraged to undertake the following as they may contribute to reducing feather pecking and cannibalism.

- Train staff in poultry husbandry skills.
- Handle birds calmly and gently when crated, carried or held.
- Check fibre, protein, mineral, vitamins and trace elements in diet.
- Use a phase feeding program based on rate of lay.
- Use high energy diets for free range birds.
- Remove poisonous plants from the range.
- Moulting birds using a high fibre diet.
- Provide hard grit and shell grit where required.
- Check there is no evidence of birds refusing feed.
- Position feeders, drinkers and nest boxes appropriately and correctly.
- Prevent muddy conditions on the range.
- Check beak and claw abrasives regularly.
- Pre-warm brooding shed before chickens arrive.
- Provide additional feed and water at placement of chickens.
- Acclimatise birds to all shed noises, equipment and activities.
- Provide ramps to allow birds to access shed from outside runs where pop-holes are high.
- Provide ramps for young birds to move from litter to slats.
- Monitor shed temperature, water and feed consumption.
- Check accuracy of time clocks.
- Check feather condition regularly.
- Prevent access to runs during inclement weather.
- Keep noise levels to a minimum.



Photo 4028mdk09.

Appendix B



FARM MANAGERS AND TEAM CHECKLIST FOR HOT BLADE BEAK TRIMMING

A checklist for farm managers and hot blade team leaders to complete when beak trimming is carried out on a flock of pullets or layer hens.

Place a tick as applicable in the left hand box.

BIOSECURITY		
	Arrival at farm	Notify the farmer on arrival.
	Declaration	Completed and signed biosecurity declaration.
	Farm biosecurity	Check farm biosecurity policy and follow instructions.
	Personal biosecurity	Do not keep backyard domestic hens or other birds at home.
	Diary	Keep a diary of all their farm visits.
	Vehicles and equipment	Vehicles and equipment are cleaned and sanitised after each beak trimming job.
EQUIPMENT SET UP		
	Stable equipment	Beak trimming equipment is set up on a secure table or legs of machine are placed on a firm base.
	Height	Beak trim equipment is set at a suitable height and position for the operator.
	Levelling	The beak trimming equipment is level.
	Lighting	Adequate lighting is available.
	Correct blades	The blades used must be designed for beak trimming.
	Sharp blades	The blades are sharp and sharp edge of the blade is facing the operator.
	Change blades	Blades are changed after every 4000 birds.
	Blade temperature	Blade temperature of 650–750 °C is used. The blade is a dull red colour.
	Base plate	The base plate is straight and clean.
	Guide distance	Guides are set at correct distance from cutting bar.
	Guide size	Correct guide is selected for chick age/size.

Place a tick as applicable in the left hand box.

WORKPLACE HEALTH AND SAFETY		
	Operator position	A seated or standing position to address the machine is used according to operator preference.
	Lighting	Adequate lighting is provided for the hot blade machine operator.
	Air quality	Equipment is set up in a position with good ventilation.
	Temperature	When temperature reaches 33 °C beak trimming is stopped.
	Dust mask	A P2 type dust mask is used, or preferably a dust mask with air supply is provided and used.
	Regular breaks	Rest breaks are taken every hour.
	Equipment safety	Beak trimming equipment is regularly checked for electrical compliance.
	Injury prevention	Extension leads are positioned to minimise the risk of tripping by staff.
	Injury prevention	Operators use cotton gloves to reduce the risk of burns to fingers.
	Injury prevention	Birds, boxes and equipment are handled carefully to prevent personal injuries.
	First aid kit	A first aid kit is available and staff know where it is located.
YARDING BIRDS		
	Chick boxes	Chicks are held at appropriate stocking density.
	Dim lighting	Lighting is dimmed (where possible) to reduce the flightiness in birds.
	Flightiness	Persons herding birds reduce flightiness by not shouting, clapping or waving hands.
	Staff movement	Staff are calm and move quietly and smoothly without rushing.
	Crates	Crates for holding birds are adequately ventilated and filled to no more than the approved stocking density.
	Pens	Pens for holding birds are adequately ventilated and not over stocked.
	Smothering	Birds are not forced into the corners of pens.
	Injuries	Pens for holding birds are free of protruding wires or other objects.
	Catching	Birds are picked up by both legs only.
	Carrying birds	A maximum of 10 hens weighing less than 2 kilograms each (five/hand) is carried.
	Location of trimmer	Birds are not carried for more than 30 metres to the beak trimming site.
HOLDING BIRDS FOR TRIMMING		
	Holding	Chicks are held gently in the palm of the hand with the thumb curled over the head and the forefinger gently placed across the throat. Older birds are held firmly either by both legs or under the arm.
	Gentle handling	Birds are handled gently and calmly.
	Injuries	Injuries are minimised, particularly to head and body.
	Position of the bird	The beak is aligned squarely on the cutting bar and raised at an angle of 15–30 degrees.

Place a tick as applicable in the left hand box.

TRIMMING		
	Lighting source	Lighting is adequate.
	Beak hardness	Beak hardness is judged by pressing the beak gently with fingernail.
	Tip of quick	The cut is made at the tip of the quick to reduce beak regrowth.
	Beak on cutting bar	The beak is aligned squarely on the cutting bar.
	Cauterisation	The cauterising time is adjusted depending on bird age, strain and length of beak removed at first trim.
	Re-cauterisation	The re-cauterising time is adjusted depending on age, and length, of beak.
	Beak trimming rate	Beak trimming rate is maintained at a maximum of 15 birds/minute.
	Ambient temperature	Trimming rate is reduced as ambient temperature in the shed increases.
	Bleeders	Birds with bleeding beaks do not exceed 1 per cent of flock.
	Rounding beaks	Beaks are rounded off on the edges.
	Severity of trim	Severe trimming may be necessary when all possible management factors have been addressed to stop persistent cannibalism.
	Angle of cut	Beaks are tilted at an angle of 15–30 degrees to achieve an inward shape to the beak.
	Monitor	All aspects of the beak trimming process are closely monitored.
	Blade cleaning	Beak residue is scraped from the cutting blade every 15–30 minutes.
	Vocalisation	Trimming procedure is checked if birds exhibit excessive vocalisation.
POST TRIMMING CHECK		
	Vocalisation	Birds do not exhibit excessive vocalisation after the operation.
	Eating and drinking	Birds commence eating and drinking soon after beak trimming.
	Appearance of wound	The beak has a light brown colour on the outer edge of the cut and a darker brown centre.
	Bleeders	There are no bleeders in the flock.
	Behaviour	Flock behaves normally.
	Culling	Moribund chicks are culled.
	Score beak trimming	At least 100 birds are assessed on the day of trimming.

Appendix C



WORK INSTRUCTIONS FOR WHEN FEATHER PECKING AND CANNIBALISM OCCURS IN A FLOCK

The current Welfare Code places responsibility on the farm owner, manager and staff to minimise feather pecking and cannibalism in poultry flocks under their care. Beak trimming is to be used as a last resort. Early detection of feather pecking or cannibalism increases the chance of corrective action being effective and maintains bird welfare if the behaviour is detected.

1. Ensure staff are trained in basic husbandry skills, remain calm and do not disturb the birds when checking or handling them.
2. Promptly remove any bird that is injured as a result of feather pecking or cannibalism, for treatment or kill humanely.
3. Consider applying anti-peck compounds to pecked birds.
4. Remove from the flock birds that instigate pecking, are aggressive or are being pecked.
5. Check for events that may have disturbed the flock pecking order.
6. Check the health of the flock. A health problem in flocks often initiates pecking mortality. Remove lame, ill, unthrifty, dead and pariah birds from the flock as other birds peck at them.
7. Check feeders, drinkers, lighting and nesting equipment are working correctly and settings are correct.
8. Review diet (fibre, protein, vitamins and minerals) and ensure adequate nutrient intake.
9. Offer a diet in mash form rather than pelleted form.
10. Check and reduce light intensity. Eliminate brighter areas and shafts of bright sunlight entering sheds. Reduce abrupt shifts in light intensity between shed and range.
11. Implement a strategy for managing floor eggs including collecting them regularly and consistently.
12. Stimulate bird activity through environmental enrichment.
13. Ensure birds are not being disturbed by vehicles, other farm noises or the presence of predators, wild birds, flies, rodents and ectoparasites.
14. Check that nesting equipment is working correctly, boxes are at the correct height and there is no overuse of nest boxes.
15. Check that hens are not attracted to peck at the exposed reproductive tract during egg laying.
16. Check shed climate and ensure that ventilation, heating and cooling equipment are working correctly and maintaining climate within requirements.
17. Monitor dust and ammonia levels as poor ventilation can increase pecking.
18. Monitor birds during abnormal weather conditions such as high humidity and temperature, thunderstorms and lightning activity.
19. Review flock history.
20. Consider re-trimming birds or fitting blinkers on advice from a veterinarian or animal husbandry specialist if changes in management have not been effective in reducing pecking.
21. Review suitability of equipment and management practices in the longer term.
22. Are unusual events such as out of feed or water, high temperature, power outage, storm, predator incursion, etc. recorded in the flock records?

Appendix D



WORK INSTRUCTIONS FOR MONITORING POULTRY AFTER INFRARED BEAK TREATMENT

Careful management of chickens after infrared beak treatment maintains flock welfare, reduces mortality, cost of production and improves farm profit. Checking birds is an important task, particularly soon after the infrared beak treated chickens have been placed.

1. Regular inspection of the chickens is important to the welfare of an infrared beak treated flock. There should be a minimum of four inspections daily in the first two weeks after placement.
2. If the flock is quiet and does not behave normally and there is not an obvious cause, the farm manager should check with the hatchery manager or a poultry consultant/veterinarian.
3. Identify birds to be culled and humanely kill them straight away. Neck dislocation is an acceptable method.
4. Water supply.
 - a) When chicks arrive on the farm provide open water troughs or cup waterers or 360 degree activated nipples for four days.
 - b) Supplementary drinkers must be provided with bidirectional nipples.
 - c) Decrease water pressure to nipples to allow droplets to form for the first three days.
 - d) Before chicks arrive, walk down the cage rows or water line and trigger every nipple to ensure it is working.
 - e) Increase water space with additional drinkers.
5. Ensure chickens are feeding and drinking within two hours after placement.
6. Monitor feed and water consumption throughout the life of the flock especially in the first few weeks after placement.
7. Record mortality daily. It should not exceed 1 per cent above the farm average during the life of the flock.
8. Record body weight of the chicks that die and conduct post-mortems to assist with determining cause of death.
9. If infrared beak treatment results in an increase in mortality 1 per cent above the farm average over the life of the flock and poor growth, the farm manager should discuss this with the hatchery and a veterinarian to resolve the problem. The farm manager should stay in close contact with the hatchery manager to discuss progress of treated birds after delivery.
10. Check the quality of beak treatment at chick delivery.
11. Monitor the beak shape and quality of infrared treated birds at 28 days, prior to, or at placement of pullets in the layer facilities if purchased as started pullets, when a bout of pecking occurs or flock's flightiness increases and towards end of lay if there are concerns about the beak shape and whether it is effectively preventing pecking. Beaks can be assessed in combination with other activities using the scoring sheets in Appendix G.
12. Measure a random sample of 100 birds.
 - a) Carefully observe the beak and record any condition such as splitting, chipping, thin keratinisation, are impacted with feed or show signs of dieback.
 - b) Score the feather condition, flightiness and behaviour of the birds at the same time.

Appendix E



WORK INSTRUCTIONS FOR MONITORING POULTRY AFTER HOT BLADE BEAK TRIMMING

Careful management of birds after hot blade beak trimming, maintains flock welfare, reduces mortality, cost of production and improves farm profit. Checking birds is an important task. Regular inspection of the birds is important to the welfare of a hot blade beak trimmed flock.

1. There should be a minimum of four inspections daily in the first two weeks after hot blade beak trimming.
2. Observe the birds at regular intervals after beak trimming. Immediately after trimming birds will be unstable when standing, but commence eating and drinking soon after. If the flock is very quiet and does not behave normally, the farm manager should ensure that there is no aspect of the operation causing problems for the birds.
3. Identify birds to be culled and humanely kill them straight away. Neck dislocation is an acceptable method.
4. Assess at least 100 birds on the day of beak trimming using the beak trimming scoring sheets: Day of trim and 14 days after trim (pages 126–127 of this handbook) to determine the effectiveness of hot blade beak trimming.
5. Ensure hot blade beak trimmed birds are feeding and drinking within two hours after trimming. Make sure that adequate quantities of feed and water are available.
6. Maintain adequate feed depth in troughs. Beak trimmed birds need access to open water troughs for at least three to four days to readjust to nipple drinkers. Water depth must be sufficient for birds with a large beak step.
7. Monitor feed and water consumption and body weight throughout the life of the flock especially in the first few weeks after hot blade beak trimming.
8. Assess the beak shape, step and imperfections at 10–14 days after trimming, prior to, or at placement of pullets in the layer facilities if purchased as started pullets, when a bout of pecking occurs or flock's flightiness increases and towards end of lay if there are concerns about the beak shape and whether it is effectively preventing pecking. Use the beak trimming scoring sheets: Day of trim and 14 days after trim (pages 126–127 of this handbook).
 - a) Score a random sample of 100 birds.
 - b) Stock attendants should carefully observe the beak and record any evidence of beaks that have bulbous growths, splitting, chipping, thin keratinisation, impacts from feed or dieback.
 - c) Score the feather condition, flightiness and behaviour of the birds at the same time.

Appendix F



AUDIT QUESTIONS AND IMPLICATIONS HATCHERY AND FARM MANAGERS NEED TO CONSIDER

Critical questions are shaded (NA = not applicable). Place a tick as applicable.

Breeder farm questions	Yes	No	NA	Implications
Does the genetic strain have a high propensity for feather pecking and cannibalism?				Pecking characteristics of flocks are heritable. Progeny may inherit pecking tendencies from the breeder flock.
Are staff looking after breeder flocks trained in bird husbandry and do they have a good attitude toward birds?				Untrained staff can cause stress to breeder flocks which is transferred to progeny via epigenetics.
Have breeder flocks been stressed during the period when fertile eggs were collected?				Stressed breeder flock may result in stressed progeny via epigenetics.
Do breeder flocks have sharp claws?				Sharp claws can be inherited by progeny and can result in injuries to other birds and cannibalism. Breeders are selecting for birds without sharp claws.
Is the diet optimised for breeder hens?				A poor diet for breeder hens may lead to a poor hatch and batches of chickens more prone to being pecked or cannibalised.

Hatchery questions	Yes	No	NA	Implications
Are fertile eggs set within the optimum weight range?				Hatching small fertile eggs may lead to smaller chicks being placed with larger chicks and the smaller chicks are more prone to being pecked or cannibalised.
Do you avoid hatching chicks from old breeder flocks with poor egg quality?				Eggs hatched from older breeder flocks and poor quality eggs may result in variable chick quality, with increased risk of pecking occurring.

Place a tick as applicable.

On-farm questions (rearing and laying)	Yes	No	NA	Implications
Have staff been trained in husbandry skills?				Untrained staff with poor attitude can stress birds and cause feather pecking.
Do staff walk through the flock calmly, quietly and consistently when checking birds?				Ensuring staff walk through the flock calmly, quietly and consistently helps to reduce fear and stress of the flock when interacting with people.
Are floor eggs picked up regularly and consistently throughout the day during the first weeks of lay?				Floor eggs can encourage birds to group together leading to smothering, injuries and feather pecking and stress in the flock.
Are injured birds and pariah birds removed from the flock as soon as possible?				Injured birds and pariah birds can attract other birds to peck at them, encouraging social transmission of feather pecking within the flock.
Do you remove dead birds from the shed as soon as possible?				Birds will peck at the carcass which can encourage feather pecking at other birds.
Are there any birds which are underweight and in poor health?				Birds which are in poor health and/or underweight should be culled as they can attract other birds to peck at them.
Is the flock's body weight uniform?				Large variations in body weight can result in feather pecking and cannibalism.
Is light intensity kept low (3–5 lux) in controlled environment housing during rearing and laying?				Keeping light intensity as low as 3 lux during rearing and less than 5 lux during lay reduces the risk of pecking.
Is light intensity managed in open-sided sheds where birds are exposed to natural light during rearing and lay?				Maintaining a light intensity of 10–15 lux from four to six weeks through to 14 weeks and then increasing to the daylight levels that the birds will experience in the shed during lay reduces the risk of pecking.
Is the ingress of direct sunlight or bright light managed in naturally ventilated/open-sided sheds?				Areas of bright light in the shed can induce feather pecking.
Is there uneven light intensity around nest boxes in open-sided sheds?				Variations in light intensity around nest boxes can cause competition for boxes in darker areas and result in pecking.
Are abrupt shifts in light intensity between shed/verandah and range areas managed?				Abrupt shifts in light intensity can trigger feather pecking and cannibalism.
Is light speckling minimised in the shed?				Variation in light speckling in the shed can stress birds and cause smothering, mortality and feather pecking.
Is the diet formulated correctly for the age of birds?				Deficiencies in protein and sulphur amino acids can result in feather pecking.
Are ration changes introduced to the flock gradually?				Changing from one diet to another quickly can stress the birds and induce feather pecking.
Is a mash diet fed to the birds?				Mash diets keep birds occupied by increasing feeding time and reducing feather pecking activity.

Place a tick as applicable.

On-farm questions (rearing and laying)	Yes	No	NA	Implications
Is adequate insoluble fibre included in the diet?				Additional fibre gives the birds a calm feeling and reduces the desire to peck at feathers.
Is indoor stocking density correct according to the current welfare code, standard or guidelines?				High stocking density may result in increased pecking and cannibalism.
Is good quality litter provided in non-slatted floor sheds or sections of sheds?				Good quality litter keeps birds occupied. Dust bathing and litter scratching reduces feather pecking activity.
Is the litter maintained in a dry friable state?				Damp litter reduces bird comfort and may lead to severe and aggressive pecking.
Is the minimum amount of paper used under brooders for chicks at placement?				Excess paper causes a mat of manure, restricts dust bathing and foraging behaviour. Chicks may engage in feather/toe pecking instead.
Is there a smell of ammonia or high dust levels in the shed?				Poor air quality can result in an increase in pecking activities.
Are noise levels kept to a minimum inside and outside the shed?				High noise levels can stress birds and encourage bouts of pecking.
Are birds exposed to extreme weather events?				Extreme weather events such as lightning can stress birds and encourage bouts of pecking.
Is environmental enrichment provided to birds to help keep them occupied during rearing and lay?				Good enrichment in sheds and on the range during rearing and lay keeps birds occupied and reduces feather pecking activity. If enrichment is used during rearing, birds are more likely to use enrichment during lay.
Are birds causing the pecking removed as soon as they are observed?				The presence of aggressive birds can result in bouts of pecking and cannibalism. If they are not removed quickly social transmission of pecking may occur.
Are the birds being pecked at removed as soon as they are observed?				If left in the flock these birds will vocalise, squawk, cower or jump which encourages the offenders to continue pecking and attracts more birds to join in.
Is all equipment including nest boxes, feeders and drinkers operating and set up correctly in the shed?				Breakdown or poor layout of equipment can stress birds and cause bouts of pecking.
Are nest boxes readily accessed by birds via steps and landing board?				Birds having difficulty reaching nest boxes may be pecked at by other birds.
Are nest boxes regularly checked for dead and broody birds and are they removed?				Carcasses and broody birds are pecked at by other birds in the nest, which stimulates further pecking at other birds.
Is the quality of infrared beak treatment checked after chicks are placed in brooder on delivery and then again at four weeks of age?				Birds that are not adequately beak treated will engage in feather pecking and cannibalism.
Is feather cover of pullets checked when birds are placed in the layer shed?				Poor feather cover at transfer to laying shed indicates pecking problems during rearing which could continue during the laying period.

Appendix G



BEAK TREATMENT, BEAK TRIMMING, FEATHER CONDITION AND BEHAVIOUR SCORING SHEETS

Scoring sheets for assessing quality of beak treatment and trimming, feather condition and bird behaviour are shown on the following pages.

Versions that include the assessment method on each sheet which are designed for photocopying are available from Australian Eggs (www.australianeggs.org.au).

Part A: Infrared beak treatment scoring

How to rate beaks

1. Select 100 birds randomly from the flock.
2. Hold the bird firmly with the beak in a closed but natural position. Do not apply any pressure on the throat as this may cause the lower beak to withdraw backwards and appear shorter.
3. Match the beak shape of each bird to the closest drawing and place a tally mark (✓ or ✗) against each beak rating scale.
4. Add tally marks in each beak rating scale, divide by the total beaks rated and work out a percentage score.

The distribution of beak shapes within these scores is influenced by the treatment prescription applied.

For birds 28 days old

The sum of scores 3, 4, 5 or 6 should represent 97 per cent of beaks.

For birds aged 12–30 weeks

The sum of scores 3, 4, 5 or 6 should represent 97 per cent of beaks. For score 6 the difference in length between the upper and lower beak tips (the beak step) must be less than 5 millimetres.

For birds older than 30 weeks



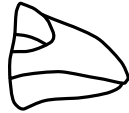




The sum of scores 3, 4 or 5 should represent 97 per cent of beaks. For score 5 the difference in length between the upper and lower beak tips (the beak step) must be less than 5 millimetres.

Comments on the quality of treatment (e.g. unusual beak shapes) should be included in the comments box at the bottom of the scoring sheet. Photos will help to describe unusual beak shapes.

BEAK TREATMENT SCORING SHEET: 12–30 weeks

Date	Hatchery	Age of flock
Farm	Hatch date	Mortality to date %
Production system*	Donor flocks	Body weight
Breed	Flock size at day old	Uniformity %
Shed/flock ID	Flock size at transfer	

* cage, aviary, barn, free range

<p>1.</p> 		<p>Total _____</p> <p>Score _____ as %</p>
<p>2.</p> 		<p>Total _____</p> <p>Score _____ as %</p>
<p>3.</p> 		<p>Total _____</p> <p>Score _____ as %</p>
<p>4.</p> 		<p>Total _____</p> <p>Score _____ as %</p>
<p>5.</p> 		<p>Total _____</p> <p>Score _____ as %</p>
<p>6. Step is less than 5mm</p> 		<p>Total _____</p> <p>Score _____ as %</p>
<p>7.</p> 		<p>Total _____</p> <p>Score _____ as %</p>

TOTAL of all scores _____ **TOTAL of 3 + 4 + 5 + 6 scores as %** _____

Part B: Beak trimming or hot blade scoring

How to score beaks

1. Select 100 birds randomly from the flock.
2. Hold the bird firmly with the beak in a closed but natural position. Do not apply any pressure on the throat as this may cause the lower beak to withdraw backwards and appear shorter.
- 3a. Match the beak shape of each bird to the closest drawing and place a tally mark (✓ or ✗) against each beak rating scale. Pay attention to the beak length and beak step.
- 3b. Check the beak for imperfections and place a tally mark in the appropriate box.
4. Add the tally marks in each beak score, divide by total beaks rated and work out a percentage score for both beak shape and imperfections.

Criteria to be applied when scoring beaks after hot blade beak trimming.

On day of trim	10–14 days after trimming	More than four weeks after trimming
Score 3+4 for block or score 4 for step		Score 3 + C
<i>Ninety per cent (90%) or more.</i> Ideal beak shape and no imperfections. Residual beak is two-thirds or more of untrimmed length. Correct trim applied.		
Correctly cauterised, no bleeding No imperfections, splitting, tears, chapping or swelling	Wound has healed, no dieback No imperfections, splitting, tears, chapping or swelling, good keratin layer on beak	No imperfections, splitting, tears, chapping or swelling or split or grooved beaks
Correct beak step (if applied) is no more than: • 1 mm at 7–10 days • 2–3 mm at 10–12 weeks	Correct beak step (if applied) is no more than: • 1 mm at 7–10 days • 2–3 mm at 10–12 weeks	Correct beak step (if applied) is: • less than 2 mm at under 10–12 weeks of age • 2–3 mm at 12–30 weeks of age • 2–4 mm at more than 30 weeks of age
Score 2+5 for block or score 2+3+5 for step		Score 2+4+B
<i>Nine per cent (9%) or less.</i> Upper beak somewhat longer or shorter than two-thirds of untrimmed length. Incorrect trim applied. Minor incorrect beak step length if step applied.		
Not cauterised adequately, bleeding	Wound has not healed, presence of dieback	
Minor imperfections—splitting, tears, chapping or swelling	Minor imperfections—tears, splitting, chapping or swelling in keratin layer	Minor imperfections such as splitting, tears, chapping or swelling in keratin layer Minor lack of keratin layer on upper beak tip
Score 1+6 for block or step		Score 1+A
<i>One per cent (1%) or less.</i> Upper beak much longer or shorter than two-thirds of untrimmed length. Unlike required shape. Big difference in upper and lower beak length		
Major imperfections—tears, splitting, chapping or swelling	Major imperfections—tears, splitting, chapping or swelling in keratin layer	Major imperfections such as tears, splitting, chapping or swelling, splitting or grooving of upper beak or no keratin layer on tip of upper beak

BEAK TRIMMING SCORING SHEET: Day of trim and 14 days after trim —BLOCK CUT

*cage, aviary, barn, free range

Date	Production system*	Shed/flock ID	Hatch date	Flock size at placement		Body weight
Farm	Breed	Age trimmed	Age of flock	Laying shed	Mortality to date	%
		weeks		Brooder		

TRIMMING SCORES				IMPERFECTION SCORES				
1 XX Too long	2 X Long	3 ✓ Ideal	4 ✓ Ideal length	5 X Short	6 XX Too short	Score A XX Major	Score B X Minor	Score C ✓ None
						Tears, spitting, chapping, swelling	Tears, spitting, chapping, swelling, bleeding, poorly cauterised wound not healed, keratin flaws	Correctly applied and cauterised, no bleeding, wound healed, good keratin layer
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Total _____	Total _____	Total _____	Total _____	Total _____	Total _____	Total _____	Total _____	Total _____
Score _____ as %	Score _____ as %	Score _____ as %	Score _____ as %	Score _____ as %	Score _____ as %	Score _____ as %	Score _____ as %	Score _____ as %

TOTAL ✓ score **3 + 4** as % _____ TOTAL X score **2 + 5** as % _____ TOTAL XX score **1 + 6** as % _____

Aim for ✓ above 90% X less than 9% XX less than 1%

BEAK TRIMMING SCORING SHEET: Day of trim and 14 days after trim —STEP CUT

Date	Production system*	Shed/flock ID	Hatch date	Flock size at placement	Body weight
				in:	
Farm	Breed	Age trimmed weeks	Age of flock	Brooder	Mortality to date %

* cage, aviary, barn, free range

Ideal step: 1 mm at 7–10 days of age, 2–3 mm at 10–12 weeks of age

TRIMMING SCORES						IMPERFECTION SCORES		
1 XX Too long	2 X Long	3 X Long step	4 ✓ Ideal length	5 X Short	6 XX Too short	Score A XX Major	Score B X Minor	Score C ✓ None
						Tears, spitting, chapping, swelling	Tears, spitting, chapping, swelling, poorly cauterised wound not healed, keratin flaws	Correctly applied and cauterised, no bleeding, wound healed, good keratin layer

Part C: Feather condition and behaviour scoring

How to rate score feather condition

1. Select 50 birds randomly from the flock.
2. Score the feather condition for each location on the bird: head and neck, back and vent, flight feathers.
3. Total the score for each location on the bird.
4. Record pecking behaviour incidents by standing still, letting the birds settle and quietly observing the flock for several minutes.
5. Score the flock flightiness.



FEATHER CONDITION AND BEHAVIOUR SCORING SHEET

Date	Shed/flock ID	Age of flock
Farm	Hatch date	Mortality to date %
Production system*	Flock number at placement:	Body weight
Breed	a. Brooding b. Laying	Uniformity %

* cage, aviary, barn, free range

Score	Condition	Plumage description	Flight feather condition
1	Good	Minor deterioration of feathers, otherwise good feathering with skin completely covered by feathers.	Intact flight feathers
2	Average	Clear deterioration of feathers with some feather loss, there may be small areas of bare skin visible.	Broken or separated flight feathers
3	Poor	Heavily damaged feathers with small to large areas of feather loss. Small to large areas of bare skin often visible.	Many flight feathers missing or broken

Bird	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
Head/neck																										
Back/vent																										
Flight feathers																										

Bird	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	
Head/neck																										
Back/vent																										
Flight feathers																										

Feather condition score summary

Totals	Head/neck	Back/vent	Flight feathers
Score 1			
Score 2			
Score 3			

Pecking behaviour

	Number of incidents
Social pecking	
Peck order pecking	
Feather sucking	
Feather pulling	
Serious feather pecking	

Flock vocalisation

Sound	Number of occurrences
Normal	
Squawking	
Warning or alert calls for danger or predators	

Flock flightiness

Calm	
Cautious	
Flighty	

Glossary

Anti-peck compounds	A product with antiseptic properties and an unpleasant taste applied to pecking wounds to deter further pecking and to aid healing.
Baffle	A device fitted to the back of the feed trough in cages to deter hens from pecking at the eggs in the egg tray.
Beak length	Length is measured from the outer tip of the nostril (or nares) to the tip of the beak, or if tipped then to the tip of the shorter beak whether it is upper or lower.
Beak tipping	Removal of a portion of the upper and lower beak by any method.
Beak treatment	Treatment of the beak of day old chickens using infrared technology resulting in a portion of the beak sloughing off by two to four weeks of age.
Beak trimming	Removal of up to one-third of the beak using hot blade technique or other cutting tools at any age.
Biosecurity	Security measures against the introduction and spread of infectious agents to a flock or farm.
Bleeders	Bird which loses blood from the beak after trimming.
Block cut	Cutting the upper and lower beak or mandibles in one motion.
Breed	A breed is a group of fowl that differs from all others of the same species in some way such as plumage, comb, wattle and leg characteristics and colour, body size and conformation, has a separate history and breed name and has been breeding true for a number of generations. See also <i>strain</i> .
Broiler/meat chicken	A strain or breed of poultry bred especially for meat production.
Bulbous growth	Abnormal growth of the beak in a bulb like shape following excessive trimming.
Cannibalism	The result of birds pecking at other birds causing blood stained skin, broken skin, raw wounds or a injured vent.
Catcher	Someone who catches, handles, places in or removes birds from a pen or crate.
Cauterise	Use of extreme heat to seal wounds and prevent infection.
Chick	A bird aged from day old to before it changes feathering from fluff to feathers (usually at three to four weeks). Also commonly used to mean a bird of any age. Has replaced the term 'fowl'.
Chipping	Small pieces of the hard outer or keratin layer of the beak that have been worn or broken away from use of the beak by the bird.
Cleaning	Removing any organic or inert material from a surface with or without water by using a dry or damp cloth, pressurised water spray, sweeper, blower or vacuum cleaner. A detergent may be added to water to aid the cleaning process.
Cloaca	The rear orifice, known as the vent or cloaca, serves as a common opening for the digestive, reproductive or egg, and urinary tracts in poultry.
Cull	Remove from the flock a bird that is sick, unthrifty, injured, unable to stand or non productive.
Dieback	A dark or gangrenous area of dead tissue on the beak.

Disinfection	The use of chemical agents to sterilise a surface by killing all bacteria, viruses and other pathogenic agents after cleaning.
Disruptive behaviour	Behaviour exhibited by pecked at birds such as vocalisation, squawking, cowering or jumping.
Donor flock	The breeder flock supplying the eggs from which a batch of chickens is hatched. Chicken orders may be supplied by hatching eggs from one or more donor or breeder flocks.
Dub	Remove a bird's comb and wattles by cutting close to the head.
Ectoparasite	External parasite.
Endoparasite	Internal parasite.
Epigenetic	Changes to the way genes are expressed as the result of stress, diet inadequacies and environmental factors that the breeders or grandparent breeders are exposed to. These external modifications to DNA that turn genes 'on' or 'off' do not change the sequence but instead affect how the embryo cells 'read' genes. The reading determines how the genes are expressed in the chicken.
Feather pecking	Pecking directed at the feathers of other birds.
Free range	Providing hens with meaningful and regular access to an outdoor range during daylight hours, with a maximum outdoor stocking density of 10,000 hens per hectare. Some exceptions apply.
Hard grit	Small rocks consumed by birds to grind feed in the gizzard.
Hatchery	Where eggs are incubated and chicks hatched.
Humidity	The amount of moisture in the air, measured as relative humidity.
Hyperalgesia	Excessive response to painful stimulus.
Infection	Swelling and redness on body part caused by bacteria or other pathogens.
Keratinisation	Growth of the external keratin layer of the beak over the trimming wound.
Layer	Bird which is sexually mature (usually 20 weeks or older).
Light speckling	Occurs when light entering the shed casts spots of light on a surface or lights the floating dust motes.
Microneuroma	A small mass of nerves that sprout and form a bundle after a nerve is cut.
Mortality	Death from disease, injury or entrapment.
Nares	The nostrils of birds.
Neuroma	A mass of nerves that sprout and form a bundle after a nerve is cut.
Pariah bird	A bird outcast from the flock showing extreme feather damage, exhibiting fast darting movements within the flock and often with a shrivelled comb. It lives on the outer edge of the flock and is adept at moving around to get feed or water to avoid being socially challenged or pecked. Essentially these birds will not be laying eggs. Also known as a 'runner'.
Peck order	The social rank of individual birds in a flock.
Perch	An arrangement that allows birds to roost above the litter or floor.
Preening gland	The uropygial gland at the base of the tail that secretes and stores oil used by birds during preening to maintain feather condition.
Pullet	A young female bird between the growth stages of replacement of the down with feathers and sexual maturity. Between about four to 18 weeks of age.

Quality assurance	Quality assurance (or QA) is a process which aims to maintain consistent procedures and standards to minimise risk.
Sanitising	Using chemical agents to kill bacteria or other pathogens.
Splitting	A crack or splitting in the hard keratin outer layer of the beak through wear and tear.
Step cut	A step created between the upper and lower beak during tipping making the upper beak length slightly shorter than the lower beak. A stepped beak makes it more difficult for a bird to get a firm grip on feathers or tissue.
Step length	The step length is the distance between the tips of the top and bottom beak.
Stereotypic behaviour	Repetitive behaviour such as pecking at objects.
Stockholm tar	A tar-based product with mild antiseptic properties, black in colour and unpleasant in taste. Acts as a deterrent to further pecking of the wound and the antiseptic properties assist healing.
Stockmanship	Stockmanship is the ability of a person to care for livestock. The stock attendant's attitudes, technical knowledge, affinity with animals and work motivation determines the standard of stockmanship applied.
Strain	A strain is a family of fowl that are genetically selected for specific traits such as those for egg or meat production, white or brown eggs, egg number and size, body weight and conformation etc. They may be derived from one breed or crosses from two or more breeds.
Stress	A physical, chemical, or emotional factor that causes bodily or mental tension in the bird which hampers the function of the immune system and may have an impact on behaviour and performance. The likely factors are a change in routine, adverse conditions in its environment, poor nutrition, poor husbandry practices, disruptive behaviours and disease.
Stressor	A chemical or biological agent, environmental condition, external stimulus or an event that causes stress to livestock.
Unthrifty	A bird that does not look well, is either losing weight or in poor condition and may have poor feather condition.
Vent	Opening of the cloaca in birds.
Vent pecking	Pecking directed at the vent of other birds.
Vice	A bad behaviour or habit exhibited by livestock.
Wattle	Fleshy body part hanging from the head or neck.
Wellbeing	The welfare state of a bird or flock. The standard of health, comfort, nutrition, environment and freedom from parasites and disease affect wellbeing.



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USEFUL WEBSITES

This handbook is supplied to all Australian layer farmers through investment of the laying chicken research and development levy. Australian Eggs also provides other tools and activities for farmers including:

- Skills and knowledge development — <https://www.aecl.org/skills-and-knowledge/>
- Business development, extension and quality assurance services — <https://www.aecl.org/quality-assurance/>
- Barnhealth — <http://www.barnhealth.com>
- Salmonella Control Workshops: final report — <https://www.aecl.org/r-and-d/activities/completed-activities/>
- Best Practice Euthanasia Workshops/Manual — <https://www.aecl.org/r-and-d/activities/completed-activities/best-practice-for-on-farm-euthanasia-of-spent-layer-hens/>
- Biosecurity Code of Practice and Manual — <https://www.aecl.org/r-and-d/activities/completed-activities/biosecurity-code-of-practice/>





'Fowl' behaviour such as feather pecking and cannibalism can be a significant problem for pullet rearers, layer farmers and poultry breeders leading to reduced bird wellbeing and lost production.

This handbook provides an overview of the problem, the various solutions available to manage it and resources that can be used by farm managers as a 'benchmark' tool to compare their current strategies with those considered to be best practice.

This handbook is supplied to all Australian layer farmers and pullet rearers through investment of the laying chicken research and development levy. Australian Eggs also provides other tools and activities for layer farmers. More information is available at www.australianeggs.org.au

