CONTROLLING FEATHER PECKING & CANNIBALISM IN LAYING HENS WITHOUT BEAK TRIMMING

A Compassion in World Farming Report

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EXECUTIVE SUMMARY

Hens are often beak trimmed to reduce the risk of welfare problems caused by feather pecking and cannibalism. The consequences of beak trimming for welfare include trauma during the procedure, pain due to tissue damage and nerve injury, loss of normal function due to reduced ability to sense materials with the beak, and loss of integrity of a living animal.

This report reviews the evidence from the scientific literature and from practical experience, which demonstrates that feather pecking and cannibalism can be controlled in non-cage systems without beak trimming through (i) the use of appropriate strains and selective breeding to further reduce the hens' propensity to feather peck and (ii) good design of non-cage systems and implementation of a range of preventive management practices.

Experience in other European countries where beak trimming has been prohibited indicates that, with experience, laying hens can be successfully managed in non-cage systems without beak trimming.

The Department for Environment, Food and Rural Affairs has repealed the ban on the beak trimming of laying hens in England, which was due to come into force on 1st January 2011. Instead, the government has merely banned the use of the hot blade method for beak-trimming, except in emergencies on-farm, while allowing beak-trimming by the infra-red (IR) beam method to continue.

Beak-trimming by the IR method is a mutilation of hens and evidence shows that it causes pain. Scientific trials show that feather pecking and cannibalism can be prevented without the use of beak trimming by keeping birds in good conditions and by selecting birds that are less prone to feather pecking and cannibalism. Compassion in World Farming urges Defra to take all necessary steps to make good on the Minister's expressed objective of banning beak trimming completely in 2016.

Introduction

Feather pecking can be a major welfare problem in laying hens and can occur both in cages and non-cage systems. Feather pecking can be gentle or severe and is distinct from aggressive pecking, which is often aimed at the head. Severe feather pecking can cause feather damage and result in denuded body areas; if pecking of these denuded areas continues, it can lead to wounding and the development of cannibalism. Cannibalism can also result from pecking around the cloaca (vent). In order to control feather pecking and cannibalism, hens are often beak trimmed.

The legal regulation of beak-trimming in the UK changed at the end of 2010. In 2002, the Welfare of Farmed Animals (England) (Amendment) Regulations 2002 (Statutory Instrument 2002 No. 1646) prohibited beak trimming of laying hens from 1st January 2011, giving the industry 8 years to prepare to end beak trimming. This prohibition was repeated in the Mutilations (Permitted Procedures) (England) Regulations 2007 (Statutory Instrument 2007 No. 1100). Similar legislation was enacted in the other countries of the UK. However, the industry failed to prepare sufficiently for the change and Ministers concluded that the ban could not be brought into effect at the scheduled date. In December 2010 the Mutilations (Permitted Procedures) (England) Regulations were amended to allow beak trimming by the infra-red technology method to continue while banning the use of the hot blade method except in emergencies (Statutory Instrument 2010 No. 3034). In Scotland the Prohibited Procedures on Protected Animals (Exemptions) (Scotland) Regulations 2010 came into force in November 2010, which allowed beak-trimming by the infra-red technology method to continue while banning the use of the hot blade method except in emergencies (Scottish Statutory Instrument 2010 No. 387).

The Minister for Agriculture at the Department for Environment, Food and Rural Affairs (Defra) also set out a timetable “working towards a future ban on beak trimming”, and committed the government to a review in 2015 and to “the objective of banning routine beak-trimming in 2016” (Hansard, 2010).

Beak trimming

Beak trimming of laying hens is permitted for laying hens in England (Statutory Instrument 2010 No. 3034) and in Scotland (Scottish Statutory Instrument 2010 No. 387) in the following circumstances:

- it may only be carried out using infra-red technology (except in an emergency to control an outbreak of feather-pecking or cannibalism);
- it may only be carried out on birds that are less than 10 days old;
- not more than one third of the beak may be removed;
- any subsequent haemorrhage must be arrested by cauterization.

The consequences of beak trimming for the welfare of laying hens include:

- **Trauma during the procedure**, including restraint by the head or neck and infra-red treatment of an organ containing a high density of nociceptors (sensory pain receptors) (FAWC, 2007). (The procedure may include cutting by a hot blade in an emergency);
- **Acute and chronic pain** due to tissue damage and nerve injury (Cheng, 2006);
- **Loss of normal function** due to reduced ability to sense materials with the beak, leading to reduced feed intake and body weight for several weeks after treatment (Kuenzel, 2007);
- **Loss of integrity of a living animal** by the removal of part of its beak (FAWC, 2007).

Internationally, laying hens are beak-trimmed using either a hot blade or by using infra-red technology. By 2010 many modern hatcheries had moved to the infra-red method and it was used for 95% of the hens that were beak-trimmed in the UK (Hansard, 2010). The infra-red technique involves focusing a high intensity infra-red beam at the tip of the beak, which penetrates the corneum, killing cells in the basal tissue. The beak tip that has been treated with the IR-beam then falls off about 10-21 days later (FAWC, 2005).

Infra-red treatment appears to have advantages over hot-blade trimming as there is no open wound and mortality following trimming is reported to be lower (FAWC, 2005). Chicks trimmed using the hot-blade method display greater levels of head shaking, beak rubbing/wiping, investigation of other chicks' beaks and whole body trembling after the operation compared with chicks trimmed using the infra-red technique (*Ibid.*).

However, the removal of the beak tip results in acute pain whether it is performed with the hot-blade or infra-red procedures (Kuenzel, 2007; Marchant-Forde *et al*, 2008) and reductions in growth and feed intake in the weeks following trimming are reported to be greater after infra-red trimming than hot-blade trimming (Honaker and Ruszler, 2004; Marchant-Forde *et al*, 2008). One piece of recent research (McKeegan and Philbey, 2009) found no evidence of chronic pain following infra-red beak trimming of day-old chicks. However, other recent research (Glatz and Hinch, 2008) found that infra-red trimming at day-old resulted in the formation and retention into adulthood of traumatic neuromas – swollen entangled nerve masses which have been implicated in causing chronic pain after beak trimming. Therefore, the possibility of long term pain following infra-red beak trimming cannot be ruled out.

There is also evidence that birds trimmed using the infra-red procedure show higher levels of fearfulness compared with hot-blade trimming at day-old (*Ibid.*). The authors suggest that the infrared trimmed birds may have been subject to greater pain during the procedure and conclude that infra-red trimming at day-old has long lasting effects on fearfulness. The pecking force of the infrared treated birds was also lower than that of birds hot-blade trimmed at one day-old, which the authors suggest may be due to a greater incidence of neuromas, and consequently higher levels of pain, in the infra-red trimmed birds.

Beak blunting as an alternative to beak trimming

Pilot studies have demonstrated that the use of abrasive materials in the feed trough effectively shortens the beaks of laying hens and appears to have no effect on beak-related behaviour or production parameters. Beak blunting could therefore provide a possible alternative to beak trimming. However, more research is necessary to conclusively establish the impact of beak blunting on plumage condition (ADAS, 2005).

Controlling feather pecking and cannibalism without beak trimming

There is concern that if beak trimming is not used there may be high levels of feather pecking and cannibalism in non-cage systems. However, scientific evidence and practical experience both show that higher levels of feather pecking and cannibalism are not inherent in non-cage systems and that feather pecking and cannibalism can be largely prevented by (i) the use of appropriate strains and selective breeding to further reduce the hens' propensity to feather peck and (ii) good design of non-cage systems and implementation of a range of preventive management practices.

The Farm Animal Welfare Council Opinion on the Beak Trimming of Laying Hens (FAWC, 2007) accepts in an uncritical manner the assertion that hens housed in barn or free-range systems will engage in feather pecking and cannibalism unless they are beak trimmed. This Opinion almost totally fails to examine the scientific evidence that shows it is possible to largely avoid feather pecking and cannibalism without resorting to beak trimming. FAWC itself has recognised the missed opportunity for the industry to proactively solve the issue of feather pecking. In a recent letter to Defra, FAWC acknowledges that the British poultry industry was made aware of the ban on beak trimming around seven years ago and states: "More effort should have been made by the industry to prepare for the ban by the development of new strains of hens or husbandry systems" (FAWC, 2009). Whilst FAWC states that it "continues to regard beak trimming as a major insult to the hen's welfare", it recommends that the ban on beak trimming should be deferred to be reviewed in 2015, with no set date for implementation (*Ibid.*). Compassion in World Farming believes that this situation is completely unacceptable.

This report will review evidence from science and practice which shows that the correct way to prevent feather pecking and cannibalism is not to beak trim hens, but to keep them in good conditions and to select birds that are less prone to feather pecking and cannibalism. Whilst further progress in breeding will be beneficial, with appropriate strains that are currently available and careful management based on existing knowledge, laying hens can be managed successfully in non-cage systems without beak trimming.

Evidence from the scientific literature

Appropriate feeding and opportunities for foraging

Commercial laying hens are typically fed a highly concentrated energy-dense diet. In natural conditions, hens spend between 50 and 90 per cent of their waking time foraging, making up to 15000 pecks a day (Webster, 2002; Picard *et al*, 2002). Hens are still motivated to forage even when provided with adequate food (Cooper and Albentosa, 2003). Evidence suggests that feather pecking is redirected ground pecking behaviour associated with foraging (Blokhuis, 1986; Huber- Eicher and Wechsler, 1997; Ramadan and von Borell, 2008) and recent research indicates that severe feather pecking in particular derives from frustrated motivation to forage (Dixon *et al*, 2008). It therefore stands to reason that appropriate feeding and design and management of systems to provide opportunities for hens to forage, with the aim of increasing the length of time birds spend engaged in foraging and feeding, is likely to reduce the incidence of feather pecking. This has been confirmed by a number of studies.

Hens that are provided with food in the form of mash rather than pellets are less likely to feather peck, as mash takes longer to eat so the hen spends more time engaged in feeding. Aerni *et al* (2000) state: “High rates of feather pecking and pronounced feather damage were only found in hens housed without access to straw and fed on pellets”. They conclude: “In order to avoid problems with feather pecking, it is recommended that laying hens are provided with foraging material and fed on mash”. El-Lethey *et al* (2000) similarly conclude: “Provision of foraging material and food form have significant effects on both feather pecking and indicators of stress”. Hartini *et al* (2002) found that the way in which food is presented, in particular that it is time consuming to eat, appears to be more important than dietary deficiencies in triggering cannibalism. Studies reported in 2010 from the Scottish Agricultural College and the Poultry Science Department of the University of Guelph found that providing forage material reduced the frequency of feather pecking by about 80% compared to the frequency when hens were kept without any environmental enrichment. The study concluded: “forage enrichments are most effective at alleviating feather pecking… and attempts should be made to develop poultry housing that allows for natural foraging behaviour’ (Dixon *et al*, 2010).

Feeding high-fibre, low-energy diets or roughage reduces feather pecking (Van Krimpen *et al*, 2005). Insoluble fibre (non-starch polysaccharides and lignin) affects gut functions and modulates nutrient digestion and there are indications that diets high in insoluble fibre are preventive of cannibalism outbreaks in laying hens (Hetland *et al*, 2004).

Norgaard-Nielson *et al* (1993) found that providing cut straw in the laying environment reduced feather pecking. Similarly, Steenfeldt *et al* (2007) found that access to maize silage, barley-pea silage or carrots decreased damaging pecking, reduced severe feather-pecking behaviour and improved plumage quality. McAdie *et al* (2005) found that environmental enrichment through the addition of

simple string devices to the pens of non-beak-trimmed birds decreased feather pecking. Jones *et al* (2000) conclude that white string is preferred to other colours and that simple string devices provide more effective environmental enrichment than more complex ones.

Providing adequate litter, maintained in a friable state, has been shown to reduce the incidence of feather pecking. For example, Zimmerman *et al* (2005) found that the use of nipple drinkers rather than bell drinkers and an improved litter management strategy contributed to a reduced level of feather pecking.

Appropriate early experiences and conditions during rearing

Research indicates that ensuring appropriate early experiences by providing enriched conditions and appropriate feeding during rearing is important in reducing the future tendency of hens to feather peck. Chow and Hogan (2005) suggest that chicks deprived of exploratory-rich environments may come to perceive pen mates as appropriate exploratory stimuli and subsequently direct exploratory behaviour toward other birds, which may lead to the development of feather pecking.

Huber-Eicher and Sebö (2001) found that early access to litter (from one day of age) increased foraging behaviour and reduced feather pecking. Similarly, Nicol *et al* (2001) showed that early experience with litter stimulated ground pecking and dustbathing and reduced the chance of feather pecking in later life.

Van Krimpen *et al* (2009) found that dietary energy dilution from hatch increased feed intake and probably also the number of feeding pecks from the first week of life onwards. The authors suggest that these pullets were likely to be more “imprinted” on their feed and therefore less oriented toward the feathers of other birds, which they suggest could explain their findings of improved feather condition at 49 weeks of age for those hens fed a 15% diluted diet during rearing.

Riber *et al* (2007) found that chicks reared with broody hens showed higher ground pecking activity, earlier development of daytime perch use and significantly lower mortality due to feather pecking and cannibalism compared with non-brooded chicks. Rodenburg *et al* (2008) conclude that the presence of a hen during rearing has profound effects on behavioural development and on reduction of feather pecking and cannibalism. They recommend that rearing chicks with a mother hen may be a very rewarding method to reduce behavioural problems in laying hens.

Minimising differences between the rearing and laying environment

Research suggests that minimising differences between the rearing and laying environment is likely to reduce the risk of injurious pecking (van de Weerd and Elson, 2006). This can be achieved by providing perches and substrate for foraging and dustbathing during rearing, by providing facilities (e.g. litter trays) on perforated platforms during early lay and providing early access to range in free-range systems (*Ibid.*).

Opportunities for resting and refuge

The provision of perches can reduce feather-pecking damage and the height of the perches is important. Wechsler and Huber-Eicher (1998) found that plumage condition was significantly better for hens kept in pens with high (70cm above floor level) rather than low (45cm above floor level) perches. They recommend that housing systems for laying hens should contain adequate foraging material and high perches to avoid welfare problems with feather pecking and feather damage. Gunnarsson *et al* (1999) found that providing perches in the rearing environment significantly reduced the risk of cannibalism during the laying period.

Riber and Forkman (2007) found that inactive birds were more likely to become the targets of both gentle and severe feather pecking. They suggest providing distinct resting areas so that mixing of active and inactive birds can be avoided. Friere *et al* (2003) also recommend the provision of refuge areas where birds can avoid pecking.

Encouraging ranging

In free-range systems, increased use of the range is strongly associated with a reduced risk of feather pecking and vent pecking (Pötzsch *et al*, 2001). Green *et al* (2000) found that, where less than 50 per cent of the flock use the outdoor area on a fine sunny day, this was a significant risk factor for feather pecking. Nicol *et al* (2003) found that the risk of feather pecking was reduced ninefold in flocks where more than 20 per cent of birds used the range on sunny days.

A number of measures can be used to encourage birds to make full use of the range. Nicol *et al* (2003) found that range use was increased by the presence of trees and/or hedges on the range. Laying hens show reduced signs of fear if the flock also contains cockerels (Oden *et al*, 2005) and this may encourage birds to range. Bestman and Wagenaar (2003) recommend keeping cockerels with layers, providing vegetative or artificial cover on the range and limiting flock size to around 500 birds to stimulate birds to use the outdoor range. It is also important to ensure that there are sufficient popholes to make it easy for hens to find their way out of the house. In some systems, the whole length of the house can be opened to encourage birds to go outside.

Limiting group size

The risk of feather pecking is generally lower in hens kept in smaller groups than in larger groups (Bilcík and Keeling, 2000; Nicol *et al*, 1999). Some free-range systems use multiple small houses, providing the ideal combination of ample space, good access to outdoor range and small social group size. It is also possible to use partitions within larger houses to allow birds to establish stable social groups by forming smaller sub-groups in different parts of the house.

Selection of birds with a lower propensity to feather peck

It is widely acknowledged that some strains of hen are much less likely to engage in feather pecking and cannibalism than others. McAdie and Keeling (2000) point out: “It has been repeatedly documented that feather pecking differs between strains of hens... It has also been demonstrated that feather pecking traits can be selected for or against.” FAWC (1997) states that genetic selection can reduce feather pecking and cannibalism “significantly and substantially”. Hocking *et al* (2004) conclude that there is a strong genetic basis for feather pecking and cannibalism and that these behaviours are not strongly related genetically to other behavioural traits. Therefore, “It should be possible to select birds that exhibit the normal range of behaviours but that do not have a propensity for feather pecking and cannibalism.”

Mortality due to cannibalism differs from conventional breeding traits because it depends on social interactions among individuals. Ellen *et al* (2008) point out that selection strategies aimed at reducing cannibalism should therefore consider both the direct effect of an individual on its own survival and the social effect of an individual on the survival of its group members (the “associative effect”). Traditional breeding accounts for only the direct effect but, recently, methods have been proposed to estimate variance components and breeding values for both direct and associative effects. Ellen *et al* (2008) estimated genetic parameters for direct and associative effects on survival in three purebred laying hen lines with intact beaks. Their results showed that heritable variation in survival is substantially larger when associative effects are included. The authors conclude that prospects for reducing mortality by means of genetic selection are good and may lead to substantial reduction in cannibalism in laying hens.

A recent review of long term selection experiments on pecking behaviour in laying hens in Sweden, Germany, Denmark and the United States confirms that pecking behaviour can be changed in the desired direction using individual or group selection procedures (Buitenhuis and Kjaer, 2008).

Whilst pointing out that “genetic tools” cannot provide the entire solution to feather pecking, Preisinger (2000) looks to the future with optimism: “If future stocks with a low propensity for feather pecking, which are currently being developed, are housed in well designed and properly managed systems, poultry farmers will be able to control feather pecking without the need for beak trimming.” Together with improvements in management and enriching the environments of the birds, Jendral and Robinson (2004) describe genetic selection as a “realistic option” to completely remove the need for beak trimming.

Whilst it is clear that substantial reductions in the propensity of hens to engage in feather pecking and cannibalism can be achieved through selective breeding and further progress in this area must be an urgent priority for breeding companies, strains of hen that are less prone to feather pecking and cannibalism are already available and are in use commercially, particularly in countries where beak

trimming is not permitted. Practical experience in these countries indicates that, with appropriate management, feather pecking and cannibalism can be controlled without beak trimming. The following section reviews the evidence from practical experience that shows how laying hens can be successfully managed in non-cage systems without beak trimming.

Evidence from practical experience

Many of the measures recommended in the scientific literature to control feather pecking and cannibalism are supported by practical experience, which also indicates a range of other diverse measures that are beneficial in reducing the risk of feather pecking. These include (Defra, 2005):

- **Matching housing conditions in rear and in lay**, e.g. same drinker and feeder systems and time of feeding;
- **Using good quality pullets**, i.e. correctly reared to an agreed lighting programme, healthy, well-feathered and of even weight;
- **Improving bird temperament**, e.g. by getting birds used to loud noises and people walking through the flock;
- **Maximising use of the range area**, e.g. by providing shelter, making water available outside and allowing hens onto the range as early as possible in the day;
- **Careful pullet transfer and transportation**, e.g. by moving birds at night, minimising time on the vehicle and careful handling;
- **Ensuring good management**, e.g. by paying attention to detail, spending sufficient time with the hens to recognise normal and abnormal behaviour, being conscientious and diligent, maintaining good records and adequate training;
- **Ensuring good house design and layout**, e.g. by careful planning of the positioning of feeders, drinkers, nest boxes, perches and lighting;
- **Maintaining good quality litter**, e.g. by using good quality material, careful design of the litter area, access arrangements and drainage, and raking or forking the litter when weather conditions are poor;
- **Minimising changes when moving pullets from the rearing farm to the laying farm**, e.g. limiting any period of restricted access to areas of the house following transfer to the laying farm;
- **Careful changes in feed**, e.g. by using a period of overlap between new and old feeds;
- **Ensuring uniformity of the flock**, e.g. by ensuring weight lost in transit between the rearing and laying farm is regained within around two weeks of arrival;
- **Preventing disease**, e.g. by ensuring pullets are given all recommended vaccinations, thorough cleansing and disinfection of the house between flocks and high standards of hygiene;
- **Preventing pest challenges (especially red mite and vermin**), e.g. by minimising harbourages (places where pests can live within the shed) and incorporating pest-proofing

features in housing and equipment design, treatment with an approved acaricide between flocks, prompt clearing of any food spillages and prompt repair of any damage to double-skinned walls and roofs;

- **Ensuring optimal nutritional intake**, e.g. by matching the nutritional composition of the feed to the requirements of the bird at all stages of its life;
- **Delaying the onset of lay**, e.g. to 20 weeks.

If hens with a low propensity to feather peck are used and the above design and management practices are adopted, feather pecking and cannibalism can be controlled in non-cage systems without beak trimming. Case studies of free-range systems for laying hens across the European Union, carried out by Compassion in World Farming, demonstrate how breed choice and preventive management practices can enable farmers to successfully use non-beak-trimmed birds. Two Swedish farms used a white strain of hen that is less likely to feather peck and kept cockerels with the hens. They experienced few problems with feather pecking and achieved mortality rates of 2-3% and 5-6%, respectively, with non-beak-trimmed birds (CIWF, 2004). One UK farm used a system where the whole length of the house can be opened to encourage birds to go outside and used the Columbian Blacktail breed of hen, which they found ranged well. The farm overcame initial problems with feather pecking by slightly reducing group size and stocking density, achieving excellent feather condition and a mortality rate of 1 .5% with non-beak-trimmed birds (*Ibid.*). This farm supplied Waitrose supermarkets; all Waitrose eggs are from non-cage systems and the large majority of its suppliers use non-beak-trimmed hens. The proportion of hens beak trimmed by Waitrose egg suppliers has decreased from around half in 2005, to a little over one third in 2007 (CIWF, 2006, 2007), down to around 15% in 2009 (CIWF, 2010b). According to Frances Westerman, Poultry and Eggs Buyer for Waitrose: “Waitrose has been working very closely with their farmers for the last 5 years and the hens from day olds to minimise stress within the birds’ life; research undertaken with Bristol university showed that stress during the early part of a hen's life could contribute to feather pecking. We are delighted with the progress that has been made and the way our farmers have risen to this new challenge.” Clearly, in those parts of the UK egg industry where proper preparations are being made to phase out beak trimming, substantial progress has been made in recent years.

Switzerland

Experience in Switzerland, where both battery cages and beak trimming have been prohibited, indicates that, with experience, beak trimming can be avoided (FAWC, 2007). Battery cages have not been permitted in Switzerland since 1992 and beak trimming has been prohibited since 2001 (Fröhlich, 2008). Some of the factors that are likely to be important in the success of non-cage systems without beak trimming in Switzerland mirror those discussed above and include:

- **Breed choice:** The majority (60%) of laying hens in Switzerland are white-feathered strains, which are less prone to feather pecking and cannibalism and are well suited to non-cage systems (Frölich, 2008);

- **Outdoor access:** The majority of laying hens in Switzerland have outdoor access, with 81% of flocks having access to a wintergarden and 65% of flocks having access to both a wintergarden and free-range area (Frölich, 2008);
- **Housing conditions:** Almost all laying hens in Switzerland (over 99%) have access to litter and the majority (over 80%) have access to raised perches (Häne *et al*, 2000);
- **System design:** Many systems in Switzerland are structured to provide separate areas for separate functions and "traffic trails" or roadways to allow hens to move between tiers or from one part of the system to another without disturbing other birds (Jendral, 2005);
- **Rearing conditions:** All pullets in Switzerland are reared with access to litter and many also have access to perches (50%) and a wintergarden (32%) (Huber-Eicher, 1999).

Scandinavia

Beak trimming has also been banned in Sweden, Norway and Finland. The Swedish University of Agricultural Sciences provides the following advice on managing flocks to minimise feather pecking:

- **Breed type:** It is important to consider the type of hybrid since there are differences between the hybrids in the amount of injurious pecking they perform – experience in Sweden indicates that white hybrids generally tend to give less problems with pecking than brown ones;
- **Feeding:** The feed must be properly balanced and a coarse feed with oats in the mixture seems to be helpful, which may be connected to a longer feeding time associated with a more fibrous feed;
- **Housing conditions:** Hens must have access to perches and litter during the whole productive period and the stocking density must not be too high since high stocking density is a stressful factor that can lead to an outbreak of injurious pecking;
- **Lighting:** It is good to have the hens get used to a light environment (preferably daylight) from day one – lighting can be lowered later to calm the birds if pecking problems develop (this option would not exist if the light was low from the beginning);
- **Rearing conditions:** The hens must get used to the kind of system they will encounter as layers from an early age – during the rearing period from 0 to 16 weeks they must have access from day one to litter and perches or something to sit on that is higher than ground level; feeding and watering equipment should be placed a little above floor level to encourage the birds to move in three dimensions.

Austria

In Austria, the majority of laying hens are kept in non-cage systems and beak trimming is not permitted under the major certification schemes. Through a combination of breeding and adjustments in rearing, feeding, health control and husbandry, Austria has reached a situation where beak trimming is almost absent. Beak trimming was reduced from 45% of hens to 5% of hens between 2000 and 2005 and since then has reduced to around 1-2%. Levels of feather damage and injurious pecking have been reduced during the same period as a result of measures taken to improve bird health and welfare (Niebuhr, 2011; CIWF, 2010a).

The phase-out of beak-trimming in Austria was achieved by a multi-faceted programme and a mediation process involving farmers, assurance schemes, veterinarians, scientists and animal welfare NGOs. Programme steps included (CIWF, 2010a, Niebuhr, 2011):

- **Economic incentives:** Farmers who continued to beak trim are paid an additional certification premium;
- **Compensation:** The money from the additional premium was available to compensate farmers who suffered additional mortalities due to leaving beaks intact;
- **Enforcement of the phase-out targets:** Each year the rearers reduced the number of birds which were beak trimmed;
- **Extension programme with veterinary advice** (run by the certification body and the Veterinary University), including a helpline for farmers. This included veterinary visits and assistance on request;
- **Data collection and analysis:** This included farm visits and data collection by the Veterinary University and the certification body, to assess levels of injurious feather pecking and whether birds had been beak trimmed.
- **Regular meetings of farmers and rearers** to facilitate the spread of best practice;
- **Programme funding** by the Ministry of Agriculture, Forestry, Environment and Water Management.

The programme's work on farms included attention to:

- **Conditions during rearing:** This ensured pullets were prepared for the laying environment (housing, diet);
- **Choice of breed:** The Lohmann Brown is most often used in Austria;
- **Diet:** This was a key factor, to ensure correct weight and protein content of feed at start of lay;
- **Provision of raised perches:** These protect resting birds from pecking and reduce the effective stocking density on the floor;

- **Appropriate stocking densities** in both rearing and laying houses. Provision of wintergardens in free-range systems helps to encourage ranging and to reduce effective indoor densities;
- **Excellent management** including good climate management (especially control of levels of pollutants such as ammonia), development of good human-animal relationships and the implementation of a proper health plan including vaccination (CIWF, 2010a).

Conclusions and recommendations

Beak trimming, both by hot-blade and infra-red techniques, has significant adverse consequences for laying hen welfare and should be avoided. Evidence from the scientific literature and from practical experience demonstrates that feather pecking and cannibalism can be controlled in non- cage systems without beak trimming through (i) the use of appropriate strains and selective breeding to further reduce the hens' propensity to feather peck and (ii) good design of non-cage systems and implementation of a range of preventive management practices.

Experience in other European countries where beak trimming has been prohibited indicates that, with experience, laying hens can be successfully managed in non-cage systems without beak trimming.

In order to control feather pecking and cannibalism without beak trimming, the following measures should be adopted:

- **Genetic selection**: Strains of hen that are less likely to feather peck should be chosen and selective breeding should be used to further reduce the propensity of hens to feather peck;
- **Feeding**: From hatch, feed should be high in insoluble fibre and should be provided in a form that is time-consuming to eat and/or additional roughage should be permanently available;
- **Foraging**: In both the rearing and the laying environment, a sufficient quantity of good quality litter material should be provided and maintained in a dry friable state to provide opportunities for foraging; environmental enrichment should also be provided in both the rearing and laying environment (e.g. scattering of whole grains, provision of whole vegetables and/or string for pecking) and consideration should be given to rearing chicks with broody hens to encourage early development of foraging and perching behaviour;
- **Resting and refuge**: High perches and refuge areas should be provided both in the rearing and laying environment and the system should be designed so as to separate resting and active birds and to allow hens to move between areas without disturbing other birds;
- **Group size**: Hens should ideally be housed in small groups or partitions should be provided in larger houses to allow birds to form smaller sub-groups;
- **Ranging**: In systems with outdoor access, ample popholes should be provided, consideration should be given to keeping cockerels with the hens and cover should be provided on the range

to encourage hens to make full use of the outside area;

- **Onset of lay**: The onset of lay should be delayed to 20 weeks;
- **Minimising changes**: Housing and management conditions during the rearing and laying periods should be matched as closely as possible and steps should be taken to minimise the impact of any changes in housing, management and/or diet during the birds' lives;
- **Controlling pests and disease**: Steps should be taken to minimise the risk of disease and pest challenges.

The scientific and practical evidence presented shows that feather pecking and cannibalism can be effectively prevented without the use of beak trimming, by keeping birds in good conditions and by selecting birds that are less prone to feather pecking and cannibalism.

Compassion in World Farming urges Defra to ensure the uptake of these measures that have been shown to be effective and to achieve a complete ban on the beak trimming of laying hens by 2016 at the latest.

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