Mutilations in poultry in European poultry production systems

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Introduction

Mutilations of animals, like beak trimming, have been subject of discussion for many years. Opponents point out the lack of respect for animal integrity and the stress and pain it causes to the animal. Although supporters argue that omitting mutilations can lead to harmful pecking behaviour causing pain and stress as well, there is a growing societal plea for adapting husbandry systems according to the behavioural needs of animals instead of mutilate animals to fit them into current husbandry practices. Better management can contribute to reducing the propensity of feather pecking in laying hens, for example, and increasing knowledge on this issue results in more success for farmers that keep non-mutilated poultry. It is often questioned, however, whether intensive poultry production systems will ever be able to do without mutilations.

Many studies have been conducted aiming at finding alternatives for mutilations, but the final solution is still lacking. Some countries have put a ban on specific mutilations. Farmers in these countries have found ways to deal with this, but the discussion on the actual improvement of welfare of birds continuous in those countries as well as discussions on the applicability of those solutions in other countries.

Besides finding alternatives for mutilations, research focused on refining the mutilating technology thus minimizing its adverse effects on the animals. Mutilations are performed at younger age or with more refined equipment or less tissue has been removed, making the mutilation less stressful and less painful for the bird. This discussion is focussing on „how strenuous is the mutilation for the animal?“ and „what are possible permanent consequences of the mutilation?“.

In the light of these two approaches, i.e. alternatives for mutilations and refinement of methods, the most common mutilations for poultry will be discussed. In this review we address beak treatments, toe clipping, de-spurring and dubbing in laying hens, parent flocks and turkeys. Finally the situation in Europe with regards to legislation and current practices will be presented.

Mutilations

Not all cutting, clipping or trimming parts of the animal's body is a mutilation. In this paper a mutilation is defined as removing or damaging a part or parts of the body, not being the horny dead body tissue and feathers. A mutilation therefore is directed on living tissue and often involves nervous and circulatory tissue. Although it is very hard to prove, it is very likely to cause acute pain. Not all tissues, however, are equally innervated and thus it is plausible that the impact will vary for the various mutilations.

Cutting a part of the beak is usually referred to as beak trimming. However, as more gentle methods are developed that are less strenuous for the animal, this should be reflected in the terminology. Therefore in this paper the more gentle measures are called beak treatments. Also, if beak trimming and beak treatments are discussed in general, they are referred to as beak treatments. Beak trimming will only be used for treatments of birds of 5 weeks or older.

Not all mutilations are applied to all species. In table 1 an overview is given of the mutilations that will be discussed in this paper and the species that are involved. As this paper addresses only mutilations applied in the Netherlands, some mutilations common in other countries are not discussed. An example is beak trimming in Ducks, which is not allowed in the Netherlands.

Table 1 Overview of most common mutilations per species (the indicated mutilations are not always applied on all genotypes)

Species	Beak treatment	Despurring	Dubbing	Toe clipping	Identification[1]
Laying hens	X				
Broiler breeding					
Parent stock		X		X	X
(Grand)grandparents	X	X		X	X
Broiler breeders	X	X		X	
Layer breeding					
Parent stock	X		X		X
(Grand)grandparents	X		X		X
Layer breeders	X		X		
Layers for vaccine production	X	X	X	X	
Turkeys[2]					
Breeder stock	X				
Meat turkeys	X				

[1] For broiler breeders this implies removing the nail of the inner toe (to distinguish the various male lines) and cutting the toe membrane (toe slit) or applying a wing band to identify individuals of genetically different groups, for layer breeders this implies the application of a wing band for identification of individuals on pure line level and toe slits for distinguishing the various genetic Lines.

[2] Desnooding of turkeys is not applied in the Netherlands anymore and therefore is not discussed.

Anatomy of the beak

The beak of a chicken is a very specialised organ. It contains many glands and senses, that help the animal in performing vital tasks, like:

- food seeking, pecking, where the tactile sense of the beak is used to find and select food particles,
- preening, where the beak is used to smooth feathers and to spread feather fat from the tail gland over them,
- nest building behaviour, where the beak is used to collect and arrange the nesting material,
- as weapon for offensive and defensive behaviour.

The centre of the beak consists of bone. The tissue around this bone is well innervated. The outer layer of the beak consists of horny tissue. This layer is thicker towards the tip of the beak.

In selecting food particles the beak is an important tool. It contains several receptors:

- Thermo receptors: these can detect differences in temperature;
- Mechano receptors: these can detect mechanical differences, thus differences in structure;
- Nociceptors, these detect damage of the beak, like for instance beak treatments.

In both chickens and turkeys the receptors are mainly located in the tip of the beak. Further to the basis the number of receptors decreases (Gentle et al., 1997).

In the tip of the beak the beak tip organ is located. In geese and ducks this organ can be found in both the upper and lower beak. In poultry this organ is only found in the lower beak. In the beak tip organ many nerves, blood vessels and sensory receptors are concentrated. The beak tip organ improves the tactile sense of the beak, supporting the bird in selecting food particles.

In the beak nerves often end into a receptor, but they can also have free nerve ends. These can mainly be found in the tip of the upper beak and in the beak tip organ in the lower beak. These free nerve ends have similar morphological characteristics as nociceptors in mammals. Therefore it is assumed that these nerve ends in birds act as nociceptors and will register damage of the beak (Gentle and Breward, 1986).

Consequences of beak treatments

Anatomical consequences of beak treatments

The traditional way of beak trimming consists of removing parts of both upper and lower beak. This is done by cutting through living tissue, removing or touching blood vessels, bone, skin and horny tissue. In case of severe beak trimming also salivary glands may be touched.

Directly after the beak treatment the wound covers with scar tissue and blood coagulates. Within a few days a thin skin layer is formed over the wound. This is replaced by horny tissue after some time (Gentle et al, 1995). The capacity of the beak to re-grow depends on the type of bird, the age the beak is treated, the amount of tissue that is removed and the extent of damage the treatment has caused in adjacent tissue. In turkey poults that were beak treated at 0, 6 and 21 days of age, Gentle et al. (1997) found re-growth of bone, cartilage, blood vessels and nerves. However the treated beaks did not contain sensory receptors and no afferent nerve vessels (nerves that send information from the beak to the brain), whereas these were abundantly present in untreated beaks. From these findings it can be concluded that the tactile senses of treated beaks are affected.

In beaks treated at 5 weeks of age Gentle (1986b) found little regeneration. Along the cutting line he found excessive scar tissue. This can prevent nerve ends from growing into the beak tip, leading to a fairly insensitive beak tip. Instead he found many neuromas right next to the scar tissue. Neuromas are uncontrolled growing nerve ends. At the point where the nerve has been cut, many nerve branches are formed. If the main nerve re-grows, these branches and thus neuromas can disappear. In severe cases of neuromas this will not happen and the branches will stay permanently (Lunam, 2005). Neuromas are not studied in detail in birds, but in mammals it is known that they can spontaneously fire many signals to the brain (Breward and Gentle, 1985 in Hughes and Gentle, 1995). These signals can be interpreted as pain signals by the central nerve centre.

Behaviour after beak treatments

In behavioural studies Gentle et al. (1990) found indications for chronic pain in laying hens whose beaks were trimmed at 16 weeks of age. The pullets showed clear changes in behaviour, directed on preventing tactile stimuli on the beak tip (less pecking to objects in the environment, less bill wiping, drinking of hot or cold water). They avoided those behaviours up to 6 weeks after beak trimming, whereas the beaks were healed after 3 weeks. According to Gentle et al. (1990) this indicates possible chronic pain in the beak. Duncan et al. (1989) also found clear differences in behaviour between

trimmed (at 16 weeks) and untrimmed hens. Especially preening behaviour and pecking to the environment was reduced and inactivity increased. Also feed and water use decreased, but this came back to normal levels quite soon, whereas the earlier mentioned behaviours only reached the original level 5 weeks after the treatment.

Age of beak trimming

Gentle et al. (1997) did not find any neuromas in beaks of turkeys that were treated at young age (0, 6 and 21 days of age) whereas he did find them in beaks of layers trimmed at 5 weeks of age. Hughes and Gentle et al. (1995) concluded that neuromas do not develop in fast growing beaks of very young birds. This was confirmed in a study of Gentle et al. (1997), where they treated the beaks of layer chicks at 1 or 10 days of age (1/3 of the beak was removed, measured from the tip to the nostril). None of the chicks developed scar tissue. The beaks had a fast regrowth, but the afferent nerves and sensory receptors were missing. The findings of Lunam and Glatz (1997) do not match this. They treated the beaks of layer chicks in the hatchery. The group that was treated moderately (1/2 of beak removed) had neuromas at 10 weeks of age, but not at 70 weeks of age. In contrast to the findings of Gentle et al. (1997) these beaks did contain sensory receptors with normal nerve ends, although the number was lower than in untreated beaks. The beaks that were trimmed severely (2/3 of beak removed) developed a lot of scar tissue and neuromas, that were still present at 70 weeks of age. In these beaks no sensory receptors were found.

From the above it can be concluded that early treatment of beaks causes the least problems with scar tissue and neuromas, but will result in more re-growth (Gentle et al. 1997, Lunam and Glatz, 1997). Glatz (2000) reviewed beak trimming at various ages and possible consequences. His findings are in short:

Beak treatment in the hatchery at 0 days of age: Provided the beaks are not cut too short this will result in beaks without neuromas and a partly regained tactile sense. Body weight of these birds may be slightly lower, but no consequences for egg weight and egg production are recorded. Some authors report a higher mortality in the first week of age. Other authors could not confirm this. If performed precisely higher mortality is not necessary. Although treatment at this age is not ideal as it falls together with other treatments (vaccinations and moving to rearing house), there are good possibilities to combine treatments (e.g. robot that combines beak treatment and vaccination). In some occasions the pullets are beak treated a second time at a later age because of too much re-growth of the beaks. In large countries with long distances between farms it may not be convenient to perform beak treatment at the farms and treatment in the hatchery is preferred.

Beak treatment at 5 - 10 days of age: At this age no neuromas are expected provided beak treatments are not too severe. The beaks will re-grow partly, but less than in the situation of treatment at 0 days of age. Effects on body weight of the pullets are not expected. Several authors didn't find an effect on growth, but found better egg production compared to birds that are treated at a later age. Re-growth is in some (non-European) countries the reason to treat again at 10-14 weeks of age.

Beak trimming at 4 - 8 weeks of age: Little re-growth is expected. Neuromas may occur, but it is unclear if these are permanent or will disappear. Van Rooijen and Van der Haar (1990) found better beaks (less abnormalities) when treated at 3 weeks of age compared to treatment at 6 weeks of age. In the rearing period the treatment may lead to temporarily lower feed and water intake and thus a short stagnation in growth. Before the EU-Directive 1999/74 was adopted beak trimming usually was performed at 6 weeks of age, leading to adequate control of feather pecking and cannibalism.

Beak trimming at 8 - 16 weeks of age: The risk for permanent neuromas is higher if birds are beak treated at an older age. Regrowth hardly occurs, but mortality as a result of the treatment may be higher compared to treatments at younger age. Van de Haar and van Rooijen (1991) found more beak abnormalities in birds trimmed at a later age.

How much is removed

Various researches indicate that the extent to which the beak has been trimmed or treated has a major influence on the final result. Shorter beaks result in better feather quality than longer beaks. Also mortality due to feather pecking and cannibalism is lower when beaks are trimmed shorter. In contrast, birds with shorter beaks have more problems with their feed intake compared with birds with longer beaks (Kuo et al, 1990; Andrade and Carson 1975; Craig and Lee, 1990; Gentle, 1986a; Cunningham, 1992; Hughes en Gentle, 1995). This difference is more pronounced when feed is provided in larger particles, due to more sensitive beaks (Gentle, 1986a; Hughes en Gentle, 1995).

Van Rooijen and Stufken (1991) studied shorter and longer beaks (after trimming) and concluded that longer beaks are preferable, because:

- the wound on the beak will heal better with a horny layer over it and without scar tissue
- less abnormalities occur in beaks that are cut less severely
- beak treatments are less strenuous, because less tissue is removed.

Lunam (2005) stated that the amount of tissue that is removed has a major influence on the results. She came to the following categories:

- mild treatment: 1/3 of upper and lower beak of layers and turkeys
- moderate treatment: ½ of upper beak and 1/3 of lower beak
- severe treatment: 2/3 of upper beak and ½ of lower beak

When applied at day-old, the mild treatment did not result in any neuromas. The moderate treatment resulted in neuromas that disappeared at later age. In the severe treatments neuromas were still present at an older age. Schwean-Lardner et al. (2004) removed up to 50% of the beak at 0, 10 and 35 days of age without any neuromas as result, which is in accordance with the findings of Lunam (2005) for the moderate treatment.

Lunam and Glatz (1997) concluded that there is a critical amount of beak tissue that can be removed. If more is cut off, the beak will not be able to recover and scar tissue and neuromas will be present permanently. In those cases the tactile abilities of the beak will not recover. If less of the beak is removed, the beak will recover without scar tissue and no permanent neuromas will develop. Also the tactile senses will recover to some extent. Beak treatments will always lead to a reduction of tactile senses of the beak.

Methods of beak treatments

For a beak treatment of laying hens, layer parents, layer type pure lines and broiler breeders a part of both upper and lower beak is removed. This is done during the rearing period. Usually a device is used that cuts part of the beak off with a hot blade that sears up the wound. There are several varieties on this concept. For pullets of 6 weeks of age and older a cross bar is used as beak support. The beaks are positioned on the support, and the blade cuts through the beak with the cutting edge striking the beak support. This method demands high skills to realise a uniform result. For young chicks usually a gauge plate is used. This is a thin, stainless steel plate with a hole through which the beak is inserted. The blade moves behind the plate thereby cutting the beak. The extent that is cut off depends on the chosen size of the hole in the gauge plate (that can be varied). Although with this method it seems easier to obtain a uniform result, this will also depend on the skills of the worker. Small chicks should not be pushed in as far as larger chicks. The method with the gauge plate is available in a normal straight shape and in a V-shape. In the straight version the knife is straight and moves vertically, in the V-shaped version the knife is V-shaped and moves horizontally. The advantage is said to be the fact that the beaks are shorter in the middle compared to the upper and lower points. This would reduce their ability to pull feathers. Although this may result in difficulties in eating (Andrade and Carson, 1975), a skilful application of this method should not give this problem. Reuvekamp and Van Niekerk (1997) did several tests with straight and V-shaped blades. They let skilful workers use

either a straight blade or V-shaped blade (both with a gauge plate) to treat 7 day old chicks. No differences were found between the two methods, beak shapes did not differ, no beak abnormalities occurred and production results were good (Van Emous, 1999; Van Emous et. al, 1998, 1999b, 2000; Van Emous and Van Niekerk, 1999c; Reuvekamp and Van Niekerk, 1999a; Van Niekerk, 1998).

For turkeys only the upper beak is treated during the rearing period. Nowadays this is done with a high energy infrared source that treats the beak tissue without any bleeding. The infrared source doesn't cut or burn, but treats the horny outside layer and the underlying basal tissue. Within a week the outer layers of the beak turn soft and after two weeks the sharp tip has eroded away. Although the method is not painless, the use of infrared seems to cause less acute and less chronic pain and one can conclude that the method is more welfare friendly to treat beaks than traditional methods. The method is already being used for turkeys. First research results indicate that the method is applicable also for layers and broiler breeders (Marchante-Forde and Cheng, 2006a, b, c)

Advantages of beak treatments

Beak treated birds perform less effective feather pecking and feather pulling, leading to less damage to the pecked bird. Beak treatments reduce the risk for cannibalism (Van Emous et al., 2001a; EFSA, 2005), that clearly reduces suffering of a part of the animals.

Many publications report a better feather cover, lower mortality, lower feed intake and lower feed conversion ratio in flocks that are beak treated (Blokhuis et al., 1987; Craig and Lee, 1990, Hughes and Michie, 1982; Van Rooijen and v.d. Haar, 1990). The better feed conversion ratio can mostly be led back to better feather quality (Blokhuis et al., 1987) and less feed spillage (Hughes and Gentle, 1995). The lower mortality and better feed conversion ratio will also lead to economic advantages. Several researchers showed that higher mortality due to the treatment will not occur provided the treatment is applied skilfully (Andrade and Carson, 1975; Van Rooijen and Van der Haar, 1990; Craig and Lee, 1990, Carey, 1990; Struwe et al., 1992).

Disadvantages of beak treatments

First and foremost any mutilation, including beak treatments, will affect the integrity of the animal involved. The animal is being adapted to the environment, whereas from the point of view of safeguarding the integrity of animals the environment should be adapted to the animal. From this point of view, performing mutilations may be seen as defending the symptoms of inadequate husbandry systems, rather than solving the problems associated with these systems. Another disadvantage is the acute pain associated with beak treatment itself. Grigor et al. (1995) recorded resistance and vocalisation of chicks that were treated, especially when using a hot blade. Following the period of acute pain a period follows in which the animal is probably fairly pain-free (Duncan et al. 1989, Gentle et al. 1991 in Hughes and Gentle, 1995). The reason is that the nociceptors (that register pain) are cut off and the nerve endings themselves do not send any extra signals. This pain-free period sometimes can last for 26 hours, after which the pain sensation will return, probably as a result of regained ability of the nerve end to send signals. Thereafter a period of chronic pain follows, that depending on the extent of the mutilation may last up to 6 weeks after treatment (Gentle et al. 1990). In case of permanent neuromas there are strong indications that at least part of the animals will experience chronic pain during the rest of their life.

Apart from neuromas, also abnormalities may occur as a consequence of beak treatments, causing pain or distress to the animal. Van Rooijen and Stufken (1990) have described several abnormalities. When the horny layer is not recovering well, the result will be a fairly soft beak tip, which is very sensitive and easily wounded. Other abnormalities are excessive scar tissue, too long lower beaks, odd beaks, too short beaks, etc. Abnormal beaks can hinder hens in their feed intake leading to reduced production.

A severe beak treatment may (temporarily) reduce feed intake so much that growth and development of the bird is reduced. This results in lower body weight at the start of the laying period and later onset of lay.

Other disadvantages focus on the image of the poultry industry, which finds it difficult to convince welfare-oriented consumers that beak treatments may be necessary and on balance beneficial if done correctly. As a minor disadvantage, the cost of beak treatments should be mentioned, which is easily recovered by reduced feed intake of better feathered hens.

Other mutilations

Although beak treatment is the most widely applied mutilation, involving various species, there are more mutilations applied to poultry. Although there are always specific reasons why mutilations are applied, they do affect the integrity of the animal involved and thus efforts should be undertaken to make them redundant.

De-spurring

Spurs of broiler breeder cockerels (parent or grandparent males) can cause deep wounds on the thighs of the hens. Therefore spurs are mostly treated directly after hatch. By pushing the spurs briefly against a hot spot, growth of the spurs is stopped. Usually no or almost no mortality is caused by this measure. As far as known no research has been conducted to investigate if de-spurring can cause acute and/or chronic pain. Gentle and Tilston (2000) found many nociceptors and nerves in the skin of poultry legs. It is therefore reasonable to expect acute stress and pain caused by de-spurring. It is unknown whether any long-term effects occur, but considering the age and extent of the mutilation it is not likely that permanent neuromas will be formed.

Some breeds don't have to be de-spurred, as males tend to have short spurs. However, a small percentage of these males will develop long spurs later in life, making a treatment of adult males necessary. This usually is done with a pair of scissors. Although no research has been done on this, de-spurring of adult cocks will be painful. Whether neuromas will occur in that situation is not known.

Cockerels of egg-type chickens also develop spurs, but they are not de-spurred. Due to their lower body weight, they are unlikely to harm the females at mating. Individual hens of some strains can be observed to develop spurs at later age, which presents a risk of getting caught in poorly designed cage floors, but prophylactic de-spurring of hens is seldom practiced.

Dubbing

Dubbing (cutting of single combs) is widely practiced in day-old parent, grandparent and pureline cockerels of egg-type and meat-type chickens for two main reasons: to identify sexing errors during rearing and to avoid losses due to excessive comb growth during adult life. If broiler breeders are reared sex-separate, dubbing to detect "sex slips" is not necessary, and intact combs may even be advantageous for sex- separate feeding. In brown-egg layer parents, dubbing may not be necessary, because the sex is identified by colour and the combs are smaller than in White Leghorns.

Undubbed White Leghorn males would have reduced vision, abnormal feed intake, physical difficulties to mate and resulting poor fertility. Also these too large combs prevent males from eating, causing higher mortality. In case parents are kept in cages, e.g. for producing vaccine eggs, dubbing is also considered necessary to prevent injuries. Dubbing is practiced in the hatchery with small (not heated) scissors. If dubbing is performed correctly there is no bleeding afterwards. To our knowledge, no research has been done to investigate possible acute or chronic pain of this measure.

Removing (parts of) the comb may have an effect on communication between birds. As one of the secondary sexual characteristics the size of the comb may influence the acceptance of the male by the female and the social status of the male (Johnsen et al., 2001; Parker and Ligon, 2002). Impaired sexual signals may hamper sexual behaviour and reduce successful matings with lower production as a result (Jones and Prescott, 2000). Research however did not find an effect of dubbing on percentage fertile eggs, production and sexual activity of males (Long and Godfrey, 1952; Fairfull et al., 1985).

A possible disadvantage of dubbing may be a reduced ability for thermal regulation (Khan and Johnson, 1970). In hot climate areas with open housing, we therefore often find broiler breeders and brown-egg layer parents with undubbed combs.

Toe clipping

The clipping of toes of broiler breeder cockerels is done to prevent injuries of the hens caused during mating. At this moment only the hind toe of all cockerels of various meat types is clipped. The same applies to meat type grand parents. In several other countries (also in Europe) it is common practice to also clip the inner toes (forwardly directed) to prevent hens being injured during mating. Also cockerels used for the production of vaccine eggs are toe clipped (hind toe).

For layer type cockerels that are weighing less, this measure is not necessary and thus not applied.

Like despurring and dubbing toe clipping is carried out directly after hatch with a device with a hot blade or hot wire. Research showed that, like in beak trimming, toe clipping may cause neuromas, although these are smaller and the effects seem to be less severe than in beaks (Gentle and Hunter, 1988). Nevertheless the procedure itself is stressful and causes pain and there is a risk for neuroma formation and thus for chronic pain.

Patterson et al. (2001) did use a microwave device to remove toe nails of chicks. Within 24 hours the basis of the treated toe nails turned white and the nail fell off in 3 days. Although the method worked, negative results were recorded for growth and the goal (less body scratches) was not reached. No other alternative methods are known.

Identification

Mutilations to identify birds are applied to distinguish pure lines, prevent sex failures and to identify individual birds in breeding programs. If other mutilations are already applied, these often are also used for identification. If no other mutilations are applied, various measures are possible to secure identification of single birds. For broiler breeders this implies removing the nail of the inner toe (to distinguish the various male lines) and cutting the toe membrane or applying a wing band to identify individuals of genetically different groups; for layer breeders this implies the application of a wing band for identification of individuals on pure line level and cutting the toe membrane for distinguishing the various genetic Lines. Removing the nail of the inner toe can be regarded in the same way as toe clipping. In both applying a wing band and cutting the toe membrane the mutilation is directed to not much more than skin tissue. Although no information on these measures is available it is not likely that they cause significant pain.

Situation for various poultry species

Laying hens

In certain situations (or under certain conditions) it is possible to omit beak treatments in laying hens. In cages with small groups (up to about 10 birds) the risk for outbreaks of pecking and cannibalism is not very high. By reducing the light level pecking can be restricted and hens with intact beaks can be kept.

In cages the risk for pecking increases with group size (Fiks et al., 2003;Tauson et al., 2005). Measures to reduce pecking, like provision of distraction materials, do not completely prevent the development of feather pecking but only reduce the risk to some extent. Although recent findings indicate that mortality can be low in flocks with intact beaks in large group cages, this requires high management skills and optimization of all factors contributing to the risk for cannibalism (EFSA, 2005; Blokhuis et al., 2007).

In non-cage systems there are more possibilities to prevent feather pecking and cannibalism. These measures however do cost labour and money and are often not easy to apply on larger farms with

more houses and large flocks. The group sizes of these large flocks also mean a higher risk compared to small non-cage flocks. Finally in non-organic farming stocking densities are probably higher than required for successful keeping of non-treated hens. Applying state-of-the-art husbandry, it does not seem advisable to house large groups of laying hens without beak treatments (EFSA, 2005).

To prevent problems with pecking various management measures are advised. None of these measures can exclude damage by pecking behaviour, but research on more promising methods continues and is certainly important. In a pilot study with laying hens it was shown that sandpaper on the bottom of the feed trough blunted the beak tip. The group with sandpaper had a lower mortality than the control, but feather cover did not differ (Fiks and Elson, 2005).

Fundamental research should address a better understanding of the causes of feather pecking and cannibalism. Areas of interest are behaviour, genetics, nutrition, neurobiology and physiology.

Breeder flocks

Not de-spurring broiler breeder cockerels may be possible in lines with relatively small spurs. Cutting of the hind toes and beak treatments in broiler breeders seem to be necessary measures for the near future. Cockerels with intact beaks and non-clipped toes cause high mortality and a lot of injured hens, and up to now no solutions for these problems have been found (Van der Haar et al., 2002). Dubbing and cutting of the inner toes is not performed anymore in broiler breeders in various countries.

For broiler breeders aggressive mating behaviour seems to be an important cause of injured hens (Jones and Prescott, 2000). Research to the cause of this behaviour may lead to possibilities to reduce or omit mutilations of broiler breeders.

Dubbing of cockerels of layer parents may not be necessary in brown-egg lines, because they have smaller combs and sex failures can be recognized. For White Leghorns, grandparents and purelines, this measure is still considered as necessary. Toe clipping and de-spurring is not performed on layer type of birds. At the moment there are insufficient alternatives to omit beak treatments (see layers). For parents used for vaccine production, de-spurring and toe clipping may not be necessary, but dubbing is.

Turkeys

Mutilations applied in turkeys are beak treatments and desnooding. The latter is more and more omitted. Beak treatments used to be done with a laser burning a small hole in the upper beak at the hatchery. The beak tip then would fall off in about 5 days. Nowadays mostly the microwave method is used in the hatchery, resulting in erosion of the beak tip within a few days.

From extensive research in the Netherlands and other countries in meat type turkey production, no satisfactory solution has been found to reduce pecking in untreated turkeys to an acceptable level (Fiks et al., 2006, Frackenpohl, 2004; Veldkamp, 1998). All forms of enrichment of the environment only have a short-term effect on the behaviour of turkeys. To keep the enrichments attractive, materials should be modified frequently. Reducing light intentensity to very low levels has an effect, but from the point of view of natural explorative behaviour it is a less desired measure. On commercial farms at this moment pilot studies are running where turkeys are offered a covered veranda. In the veranda itself and through the outlet openings the turkeys are exposed to large amounts of light, so dimming of lights is not an option.

The current situation in Europe

There is a lot of variation between European countries with regards to legislation and practice of mutilations in poultry. Only beak treatments of laying hens are regulated on a European level. In Council Directive 1999/74/EC of 19 July 1999 laying down minimum standards for the protection of laying hens, beak trimming is regulated in the annex, which states under no. 8: „ Without prejudice

to the provisions of point 19 of the Annex to Directive 98/58/EC, all mutilation shall be prohibited. In order to prevent feather pecking and cannibalism, however, the Member States may authorise beak trimming provided it is carried out by qualified staff on chickens that are less than 10 days old and intended for laying.“ For the other mutilations no European legislation is available and countries differ in regulations and in practice.

The strictest legislation regarding mutilations is in force in Scandinavian countries (Norway, Sweden, Finland), where beak treatments are not allowed and other mutilations are also banned or strictly regulated (Table 2). In Denmark, Germany and Belgium beak treatments are only allowed if there is proof or a strong indication that in the given situation omitting beak treatments will cause serious welfare problems. In practice this means that on almost all farms, and certainly in non-cage systems, beak treatments are applied. In the UK, the Netherlands and Austria beak treatments are still allowed, but National legislation is in force to regulate the application of mutilations. In the UK and the Netherlands a date for banning beak treatments is already set, although new insights may lead to modification of the (proposed) legislation. In Austria over 95 % of the hens are not beak trimmed.

With regards to other mutilations, many countries don’t have any regulations. In general countries with strict National legislation regarding beak treatments also have regulated other mutilations. Most Southern and Eastern European countries have no other legislation regarding mutilations except the Council Directive 1999/74.

The actual situation in European countries is not much different from what their legislation prescribes. In some situations exemptions on a ban on beak trimming are made routinely, but in other countries beak treatments are not performed anymore, whereas there still are legal possibilities.

Table 2: Legislation regarding mutilations in Europe

BEAK TRIMMING			OTHER MUTILATIONS		
Allowed (EU-Directive)	Strictly regulated	Not allowed	Not regulated, allowed	Regulated, but (mostly) allowed	Regulated and (mostly) not allowed
Czech Rep. France Hungary Ireland Italy Poland Spain	Austria Belgium Denmark Germany Netherlands Switzerland UK	Finland Norway Sweden	Czech Rep. France Ireland Italy Poland Spain	Austria Belgium Denmark Finland Hungary Netherlands Switzerland UK	Norway Sweden

No information: Bosnia, Croatia, Romania, Serbia-Montenegro, Slovenia, Slowakia

Summary

In commercially kept poultry, mutilations are applied to prevent behaviour of individuals which may become harmful for group members. Mutilations discussed in this paper are: beak trimming (in laying hens, breeders of egg-type and meat-type chickens and turkeys), de-spurring (in meat-type parent males), toe clipping (in broiler parent and grandparent males), dubbing (in egg-type and meat-type parent males) and various ways for individual identification (of egg-type and meat-type parents and grand parents).

Mutilations cause acute pain when applied and can in some situations cause chronic pain sensation, depending on the age and extent of the mutilation. Although mutilations are mostly done to prevent injuries to birds, opponents feel there should be alternative management strategies to safeguard the

animals from injurious behaviour. However, for the current intensive as well as organic poultry husbandry systems these alternatives do not provide a satisfactory control of injuries and mortality.

A European Directive is in force only for beak trimming of laying hens. Local governments may already have or plan to impose more strict regulations and in some countries even ban mutilations. In general the situation in practice is in accordance with the legislation.

Zusammenfassung

Eingriffe beim Geflügel in europäischen Haltungssystemen

Eingriffe beim Geflügel werden vor allem praktiziert, um einem Verhalten von Tieren vorzubeugen, das sich nachteilig für die Tiere selbst und andere Tiere im Bestand auswirken kann. Im Einzelnen werden in dieser Übersicht folgende Eingriffe behandelt: Schnabelstutzen (bei Legehennen, Elterntieren und Puten), Sporenbrennen und Zehenschneiden (bei Broilerelterntierhähnen), Kämmeschneiden (bei Lege- und Mastelterntieren) und verschiedene Arten individueller Kennzeichnung.

Eingriffe können bei ihrer Anwendung akute Schmerzen und je nach Alter der Küken und Intensität der Eingriffe chronische Schmerzen verursachen. Obwohl die Eingriffe vor allem Leiden anderer Tiere durch Pickverletzungen verhindern sollen, fordern Gegner dieser Praktiken andere Lösungen. Nach heutigem Wissensstand lässt sich jedoch eine befriedigende Vorbeuge gegen Kannibalismus und Federpicken ohne Schnabelbehandlung nicht erreichen.

Eine Europäische Direktive zu Eingriffen gibt es bisher nur für das Schnabelstutzen von Legehennen. Einzelne Mitgliedsstaaten der EU können schärfere Regeln gegen Eingriffe erlassen und haben dies z.T. bereits getan. Die Praxis folgt im Allgemeinen den gesetzlichen Vorgaben.

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