RSPCA standards justification

Turkeys

Contents

Introduction

This document provides the rationale underpinning the setting of certain, key standards within the RSPCA Welfare Standards for Turkeys. As such, this document provides the justification behind the setting of such standards.

Not all standards are covered within this document, as either further explanation is not required, e.g. the justification is clear within the standard itself, or the standard is based on a legal requirement. However, those standards that go above legal minimum requirements and could be set at a range of levels are generally included.

Justifications are not exhaustive, but are typically representative of the evidence base (where this exists) for that issue.

In some cases, a summary of the full standard wording has been provided. Therefore, please refer to the RSPCA Welfare Standards for Turkeys for the full standard wording.

References to legal requirements relate to domestic legislation.

Poults

Specific provisions for turkey poults

- **Natural daylight must be provided by no later than 10 days of age and through all the required openings by no later than 17 days of age.**

  This requirement was introduced in the 2023 version of the standards, as research shows that ultraviolet (UV) light can encourage foraging and feeding behaviours, improve bone calcification and help reduce injurious pecking. As windows can filter out UV light, the inclusion of artificial UV lamps in the house is also strongly encouraged. Research has found that the inclusion of UV light from hatching prevents the initial injurious pecking (Moinard *et al.*, 2001), with researchers suspecting that pen mates resort to damaging pecking if they are unable to display and read plumage signals normally used for communication (Moinard & Sherwin, 1999).

Food and Water

Food

- **Feeder space: Where troughs are used, there must be a minimum of 30mm feeding space per bird, which may need to be increased depending on lighting programmes.**

  This requirement has been included within the standards since they were first launched in 1996 and it has been implemented on farm for the past 20 years. It was based on best practice and/or manufacturer's recommendations at the time.

- **Track feeders: Track feeders/feeder chains are prohibited.**

  The standard was introduced in the March 2007 version of the standards and was based on information from industry, producers and practical experience, and centred around two key concerns. Firstly, track feeders can pose a risk to bird welfare, especially poults, as they can become trapped in the drive unit or injured by the track conveyor itself. Second, track feeders also have the potential to impede the movement of the birds around the house. The RSPCA believes that the alternative feeding systems, such as troughs and pan feeders, offer a better mechanism for delivering feed to the birds without unduly compromising their welfare.

Water

- **Drinker space: The minimum number of drinkers which must be provided are as follows:**

Bell	**1 per 100 turkeys**
Nipple	**1 per 10 turkeys**
Cup	**1 per 28 turkeys**

This requirement has been included within the standards since they were first launched in 1996, and has been implemented on farms for the past 20 years. It was based on best practice, manufacturer's recommendations and/or breed management guidelines present at that time.

Environment

Floor and litter

- **Litter provision and quality: Numerous standards relating to litter, including: minimum depth of 5cm; suitable material and particle size; managed to maintain it in a dry, friable condition; allows birds to dustbathe; Litter that is wet or otherwise contaminated must not be introduced into turkey housing; litter must not be allowed to become wet, infested with mites or otherwise harmfully contaminated; and wet litter must be replaced immediately.**

  Standards relating to litter have been included in the standards since the first version was launched in 1996.

  Litter provides several functions for poultry, including the provision of comfortable resting, dustbathing and foraging areas. Domestic turkeys have retained many of the behavioural characteristics of their ancestors, including spending approximately 50% of their active time in feeding related behaviour, including investigating their surroundings and pecking, and exhibit the same wide range of comfort and grooming activities, including dust-bathing (Council of Europe, 2001). It is therefore important that the litter provided enables birds to perform these natural behaviours.

  The health and welfare of turkeys is considered to be closely linked to litter quality; management of litter is therefore of great importance (Farm Animal Welfare Council, 1995). Contact with wet or capped litter can predispose birds to foot pad dermatitis (FPD - see below), breast blisters and 'shaky leg syndrome', whilst resultant high ammonia concentrations at bird level can predispose birds to respiratory and ocular diseases (Farm Animal Welfare Council, 1995).

  Wet litter is a major factor affecting the prevalence and severity of FPD in turkeys (Mayne *et al.*, 2007), which is a potentially painful contact dermatitis in which the metatarsal and digital pads become swollen, discoloured and hard (Sinclair *et al.*, 2015). Wet litter can cause FPD in a short space of time in young turkeys (Mayne *et al.*, 2007), and research has shown that turkey poults reared on wet litter have an increased incidence and severity of FPD lesions (Glatz & Rodda, 2013). Maintaining good litter condition is also important to reduce the occurrence of breast buttons (focal ulcerative dermatitis) and breast blisters (sternal bursitis) (Mayne *et al.*, 2007). These conditions are considered to potentially be associated with pain and discomfort (Broom & Reefmann, 2005). It is therefore important to prevent wet litter, and where this does occur to appropriately manage it in order to reduce the health and welfare issues this can cause. For instance, drinker design and operation, ventilation and humidity within the turkey house and the management of litter (e.g. removing/replacing wet litter, adding fresh litter, and turning over litter) can all help control wet litter (Glatz & Rodda, 2013; Mayne *et al.*, 2007).

Lighting

- **Light schedules: Within each 24-hour period turkeys must be provided with a minimum period of 8 hours continuous light during the natural light period, and a minimum period of 8 hours continuous darkness during the natural dark period. Exceptions to the minimum 8 hour period of continuous darkness are permitted for birds kept under natural lighting conditions when the natural period of darkness is shorter and for birds up to 3 days of age.**

  Standards relating to the provision of natural daylight were introduced in the March 2010 version of the standards, whilst the current requirements on light schedules were introduced in September 2017.

  Research on turkey vision has identified that damage to the eyes occurs when birds are kept under either very dimly lit conditions and/or when they are exposed to prolonged lighting. This can lead to a condition known as 'bupthalmia', which can result in temporary or even permanent blindness.

  Light periods of between 8 and 16 hours are thought to have a range of welfare benefits for poultry, such as improving gait score and leg health, reducing mortality and the incidence of ocular development problems. Due to the requirement for turkeys to be exposed to natural daylight and natural dawn and dusk periods, a minimum 8 hour period of continuous light is required.

  Birds raised under continuous lighting are thought to be more fearful than birds raised with periods of darkness (Yang *et al.*, 2022). Further, a minimum of 8 hours of darkness is for good bone development and optimum performance is recommended by Aviagen Turkeys (Aviagen, n.d.).

- **Lighting patterns: The use of intermittent lighting patterns to meet the minimum 8 hours of darkness is not permitted, except for the first 36 hours after placement.**

  Introduced in the August 2004 version of the standards, intermittent lighting patterns have been reported to affect musculoskeletal function (Sherwin *et al.*, 1999b), increase the incidence of leg abnormalities (Clarke *et al.*, 1993) and the occurrence of blindness (Sherwin *et al.*, 1999b). As such, research recommends that intermittent lighting patterns be avoided (Glatz & Rodda, 2013).

- **Light levels: During the light period no area must be lit at less than 20 lux. Outside the 8 hour light period, but not during the dark period, no area must be lit at less than 6 lux.**

  The current wording was introduced in the September 2017 version of the standards. However, a requirement for a minimum illumination of 20 lux throughout the house has been included in the standards since they were first published in 1996. The requirement for the shaded areas to be lit at no less than 6 lux was introduced in 2004.

  The Farm Animal Welfare Council (now known at the Animal Welfare Committee) advised that where light intensity is reduced, birds are less active and unable to adequately investigate their environment. As a result, they recommended the adoption of light levels as bright as practical with lights only lowered in the event of aggression (FAWC, 1995).

  Scientific studies have demonstrated that turkeys actively avoid very low lighting levels, around 2 lux, and prefer more brightly lit conditions, especially during the first few weeks of life. Research on turkey vision has shown that damage to the eyes occurs when birds are kept under very dimly lit conditions and/or when they are exposed to prolonged lighting. This can lead to a condition known as 'bupthalmia', which can result in temporary or even permanent blindness. There is evidence that such problems can arise when birds are kept at lighting levels as low as 2 to 5 lux, and even at 10 lux changes to the eye have been recorded. Further, research has shown that turkeys demonstrate a

greater preference to spend longer periods of time in brighter lit environments (20 and 200 lux versus 1 and 6 lux) (Barber *et al.*, 2004). For these reasons, the RSPCA does not permit the use of very low lighting levels, although the provision of shaded areas is permitted for resting.

Practical experience has shown that there are benefits to providing turkeys with a variable lighting level throughout the house. Darker areas provide the opportunity to rest whilst brighter lit areas allow birds to perform more active behaviours. Spatially variable lighting has also been reported to help reduce the incidence of feather pecking.

- **Natural light provision: Birds must be provided with natural daylight (by 10 days of age) at all times during the daylight period.**

  The requirement for natural light was introduced in the March 2010 version of the standards.

  Artificial light sources are thought to impose a degree of visual sensory deprivation in turkeys - inhibiting foraging, exploration and social behaviours. Not allowing birds to use their full range of visual abilities is likely to have negative consequences on their behaviour and welfare (Barber *et al.*, 2004).

  The introduction of natural light into turkey houses is likely to be beneficial to bird welfare by, for example, increasing activity and enriching the birds environment and providing a range of illuminance levels in different areas within the house, which changes throughout the day. Further, daylight contains ultraviolet (UV) light, whereas fluorescent and incandescent lamps emit minimal UV light (Moinard & Sherwin, 1999). Markings on the feathers of turkeys are visible under UV light (Sherwin & Devereux, 1999) and it is thought that UV light allows turkeys to pick up on visual cues, which may be important for the performance of a range of visually mediated behaviours, including foraging, and for recognition (Barber *et al.*, 2004; Lewis *et al.*, 2000; Moinard & Sherwin, 1999).

- **Patches of light: Where there are areas of different light intensity within the house, there must be a gradual change in light intensity between each area and no patches of bright light on the floor of the house.**

  This requirement was introduced to the 2010 version of the standards as patches of light can become a focus for pecking behaviour. Therefore, it is important to achieve a uniform distribution of light within the house.

Stocking density

- **Stocking density: Stocking density must never exceed 25kg/m^2 or be planned to exceed 25kg/m^2.**

  The maximum stocking density of 25kg/m^2 has been included within the standards since the November 1996 version was published, with the current wording introduced in September 2012.

  Legislation (Commission Regulation EC/543/, 2008) requires that the terms ‘free-range’ and ‘extensive indoor/barn-reared’ may only be used where the stocking rate of turkeys does not exceed 25kg live weight per m² floor space. This stocking density provides birds with space to move around freely and exhibit their normal behaviours.

- **Thinning: Thinning is not permitted i.e. the number of birds placed in a building must be no more than the number required to rear all the birds to the maximum stocking density once, which is to be at depopulation.**

Included within the standards in the March 2010 version, thinning is characterised by placing additional birds into a building so that the maximum stocking density can be reached on one or more occasions prior to final depopulation (the removal of all birds from the building). During the rearing period, a proportion of the birds are removed from the building at planned times to ensure the maximum stocking density is not exceeded. Therefore, thinning is defined as the planned removal of a proportion of birds, on one or more occasions, from a building so as not to exceed the required maximum stocking density.

The chicken standards justification document includes a good explanation of the justification for prohibiting thinning - much of which is likely to be applicable to turkeys. See 'Chicken standards justification' for details.

Environmental enrichment

- **Environmental enrichment: Turkeys must be provided with straw bales, perching, lengths of rope and visual barriers.**

  A requirement for the provision of straw bales, perching and rope has been required in the standards since March 2007, with visual barriers introduced to the standards from March 2010.

  Turkeys are naturally inquisitive and explore their environment by pecking to investigate objects. The provision of effective and suitable forms of environmental enrichment can encourage increased activity levels and has been shown to promote good health and reduce the risk of feather pecking occuring (Dalton *et al.*, 2013; Martrenchar *et al.*, 2001; Sherwin *et al.*, 1999a, 1999b). Injurious pecking in turkey flocks is thought to be a redirected foraging behaviour although there can be many potential causes, including genetics, environment and diet (Dalton *et al.*, 2013).

- **Straw bales:** Straw bales can provide multiple functions in a turkey house, including the provision of a destructible form of enrichment, as a pecking object, as an area to rest on or against, and as a visual barrier. In general, straw is considered a good foraging substrate for poultry. Research by *Sherwin et al.* (1999a) concluded that simultaneously providing turkeys with supplementary UV radiation, straw, pecking substrates and visual barriers had a beneficial effect on bird welfare by significantly reducing the incidence of injuries from wing, tail and head pecking in turkey poults.

  Further, straw bales add variability to the environment as they become dismantled over time. When they are initially placed into the house, they provide areas for the birds to seek shelter and rest. A desirable benefit of conventional bales is that they are more robust and last for a long period of time and birds can access the straw from all around the bale. Bales of plastic wrapped chopped straw may not serve the same function as conventional straw bales – the RSPCA is not aware of any research that has examined this.

- **Rope:** The provision of rope as an enrichment item has been shown to have positive effects in poultry. For instance, research in meat chickens has shown that the provision of string as a pecking object has the potential to improve welfare as it serves as an enrichment stimulus (Bailie & O'Connell, 2015). Further, reduced gait scores have been observed in chickens provided with string compared to those without, suggesting positive effects of string on walking ability (Bailie & O'Connell, 2015). Jones *et al.* (2002) suggested that string may be a practical and effective form of environmental enrichment for laying hens. It is therefore also considered a good form of enrichment for turkeys, and has been a requirement within the standards since 2007. To help prevent turkeys from being injured by rope, it is important that the rope is knotted near each end to prevent the entire rope from fraying.

- **Perches:** The provision of perches allows birds to express their natural behaviour; in the wild turkeys roost in trees at night and for protection from predators (Council of Europe, 2001). Martrenchar *et al.*

(2001) suggested that perches could be beneficial by giving birds the opportunity to perform natural behaviours, and to decrease crowding at floor level. The standards recommend that elevated solid table structures may be a beneficial addition to the turkeys environment and that careful consideration is given to the perching requirements of turkeys reared above 10 weeks of age.

- **Visual barriers:** The standards require visual barriers are provided; these act as a resting area, an area of refuge and may assist in preventing the spread of injurious pecking behaviour within a flock.

The range

- **Management of overhead shade and shelter: The range must be managed in order to provide the most suitable conditions to encourage the birds to roam, with the provision of overhead shade and shelter (natural, artificial or a combination of both) appropriately distributed to encourage full use of the range.**

  This standard was introduced in the March 2010 version of the standards. Turkeys are prey animals and are naturally wary of overhead predators; in the wild turkeys need trees for roosting at night and to provide protection from predators (Council of Europe, 2001). The provision of shade and shelter, and having shelters close to the house, encourage birds out onto the range and to make full use of this facility.

- **Natural cover: Natural cover must be present in the form of existing or newly planted trees/shrubs/cover crops/other at an area equal to at least 5% of the total range area.**

  Introduced to the standards in September 2012, as research and experience demonstrated the potential of natural cover to help encourage birds to use the range more fully. The standards therefore aim to encourage birds to make better use of the range, and to provide a safe and enriched ranging environment to benefit the health and welfare of the birds.

  The benefits of natural cover and improved ranging include:
  - greater behavioural opportunity through additional dust-bathing and foraging provision;
  - reduced poaching around the pop holes & improved litter indoors;
  - reduced risk of disease spread due to greater dispersal of manure load;
  - diet supplementation from the vegetation itself and the invertebrates attracted by it.

- **Enrichment on the range: Additional facilities, or designated existing natural elements, must be provided for dustbathing/perching/foraging or a combination of these behaviours.**

  Introduced to the standards in September 2012 as increased enrichment on the range can help to encourage birds outside onto the range, to fully use the range and to allow turkeys to exhibit their natural behaviours, such as foraging/investigating and dustbathing.

Health

- **Health monitoring: Where birds with a severe level of foot pad burn, or those with breast blistering or back scratching have been identified the farm must take appropriate action to prevent these conditions in subsequent flocks.**

  Introduced to the standards in the 2007 version of the standards, these requirements ensure that producers are recording and monitoring foot pad burn, breast blisters, back scratches and dirty feathers, and taking measures to reduce the incidence and severity of these issues where necessary.

  Breast blisters and lesions to the foot pad (foot pad dermatitis or foot pad burn) can be caused by contact with litter which is both wet and contains a high level of ammonia from faeces. Severe foot pad lesions can result in lameness, act as a gateway for bacterial infection and cause pain. No bird should have such lesions. Monitoring and reporting back to the farm on the prevalence of these issues within flocks, can enable appropriate action to be taken to reduce these issues for subsequent flocks.

- **Lameness: There must not be any overtly lame birds within the flock.**

  The standard was introduced in the 2010 version of the standards. Lameness can be a serious welfare problem in growing turkeys, whether caused by infectious agents or growth abnormalities. Research has concluded that bird welfare is unduly compromised in birds with gait scores of 3 or more, as the birds are likely to experience pain and discomfort. In fact, anatomical research on chickens has shown that such joint pathologies are likely to be as painful to chickens as they are to humans. A bird's level of lameness can be determined by assessing its walking ability (by gait scoring).

  Leg disorders can be particularly prevalent in birds close to killing weight, especially in heavier finishing stags. Management techniques, such as the provision of enrichment items that encourage activity, and good litter and biosecurity management, can help prevent the occurrence of leg disorders. However, an underlying problem is that birds have been genetically selected, and are usually fed, to maximise muscle weight at the time of slaughter.

Mutilations

- **Beak trimming: Where practised, beak trimming must be carried out using appropriate infra-red equipment.**

  The practice of beak trimming is contrary to the principles of the RSPCA welfare standards. However, at the present time, it is accepted that in some cases, such as in naturally lit systems, it may be necessary to beak trim to deter potential injurious pecking. The RSPCA welfare standards for turkeys require that birds are provided with natural light by 10 days of age at the latest.

  Infrared technology has been shown to offer higher standards of welfare compared with conventional methods by improving the accuracy and reducing the risk of pain associated with the process. This became the only method permitted for the beak trimming of day old poults when the 2017 version of the standards was published.

Transport

Transport

- **Transport time: The time from when the birds leave the farm to arriving at the processing plant must be no longer than 4 hours.**

This requirement was introduced in the 2010 version of the standards. Transport can be stressful for poultry, with birds being exposed to unusual sights, sounds, smells, movement and people. In addition, prior to and during transport birds are deprived of food and water. There is also a risk of birds suffering from cold or heat stress depending on the ambient temperature, weather conditions and the conditions of transport. It is therefore important to keep transport time and the total time that birds spend within crates to the minimum possible (Warriss & Brown, 1996).

Slaughter / killing

Shackling

- **Live bird shackling: The shackling of conscious birds is prohibited, unless under specific circumstances i.e. slaughtered/killed on the farm they were reared for finishing, and birds are not subject to transport, and shackling is the only commercially viable means.**

This requirement was introduced to the standards in September 2012. Shackling a bird can cause discomfort and pain, it is therefore only permitted within the standards under specific circumstances and with written permission from the RSPCA Farm Animals Department. The RSPCA will phase out inverted shackling of conscious birds as soon as a commercially viable and more humane alternative method of slaughter/killing is available and suitable for use on-farm.

Shackling

- **Carbon dioxide gas: Carbon dioxide (delivered in two phases) is permitted provided that it does not exceed an *average* maximum concentration of 30%, and a maximum concentration of 33%, until birds have lost consciousness.**

Carbon dioxide is aversive to poultry and has been described as an acidic gas – pungent to inhale at high concentrations and a potent respiratory stimulant – which can cause birds to experience unpleasant sensations (FAWC, 2009; EFSA, 2004b; McKeegan *et al.*, 2006; Raj & Tserveni-Gousi, 2000). The degree of aversion to carbon dioxide increases as the concentration rises (McKeegan *et al.*, 2006), with research suggesting that birds start to detect its presence at around 7% (Ray & Gregory, 1991) and aversion being seen in some individuals at 25% (McKeegan *et al.*, 2006). Concentrations of carbon dioxide above 40% are considered to be particularly aversive (FAWC, 2009; EFSA, 2004b; McKeegan *et al.*, 2006). However, it has also been suggested that concentrations above 30% are aversive (EFSA, 2004b; Humane Slaughter Association, 2005). The 2004 European Food Safety Authority opinion on *the welfare aspects of the main systems of stunning and killing the main commercial species of animals* suggested that discomfort may appear at concentrations of around 25% in chickens and 30% in turkeys. Using carbon dioxide at

concentrations of 30% to induce unconsciousness has been recommended by some researchers (Raj & Tserveni-Gousi, 2000) and it has been suggested that using this concentration minimises the gases pungency (Ray *et al.*, 1992).

Prior to the introduction of this standard in 2017, the RSPCA welfare standards for turkeys already permitted exposure of birds to 30% carbon dioxide mixed with inert gases. Research that looked at varying levels of carbon dioxide in air and in nitrogen, suggested that as the behaviours observed were similar (i.e. headshaking rose monotonically and respiratory disruption observed at all concentrations) in both gas mixtures, it is the carbon dioxide causing the response rather than the carrier gas (McKeegan *et al.*, 2006). Further, results from a study by Gerritzen *et al.* (2004) showed that headshaking began at the same carbon dioxide concentration in all the gas mixtures they tested, and therefore suggested it was likely that headshaking is a reaction to increasing carbon dioxide levels. As such, it is reasonable to expect similar behavioural responses to carbon dioxide whether delivered in inert gases or in air, and therefore maintaining a 30% maximum limit in the standards was considered appropriate.

Therefore, the RSPCA welfare standards permit an average maximum concentration of 30% carbon dioxide. However, due to the nature of gas injection systems, it is acknowledged that there will be some variability in the concentration of carbon dioxide within the system. Therefore, a 10% tolerance on this concentration has been applied, i.e. permitting a maximum concentration of 33% carbon dioxide.

Following loss of consciousness by exposure to carbon dioxide gas only, it is a legal requirement to expose poultry to a concentration of carbon dioxide above 40% until death, which is classified as *Phase 2* (EC, 2009).

Gradually increasing concentrations of carbon dioxide: For processors choosing to use carbon dioxide gas only, new systems installed from 1st January 2018 must be designed and operated to expose birds to a gradually increasing concentration of carbon dioxide until the birds have lost consciousness.

Research suggests that exposure to a gradually increasing concentration of carbon dioxide will result in a smoother transition to unconsciousness and avoid the negative effects of high concentrations of carbon dioxide whilst birds are conscious (Gerritzen *et al.*, 2004; Gerritzen *at al.*, 2007). This is supported by direct observation of different gas killing systems. However, systems that expose birds to a maximum concentration of 30% carbon dioxide on induction until loss of consciousness may be considered acceptable (see rationale for '*Carbon dioxide only gas killing*'), but a gradual increase starting from a low level is preferred. Therefore this standard takes a practical approach to ensure that going forwards any new systems installed gradually increase concentrations of carbon dioxide.

Monitoring birds within the gas killing system: There must be a means of clearly visually monitoring in real time the birds throughout the gas killing process, i.e. from start/point of entry to finish/exit.

The *Welfare of Animals at the Time of Killing (England) Regulations 2015* require a means of visually monitoring poultry in the gas stunner. From a practical perspective, it is important to be able to check that induction to unconsciousness is calm and to assess when birds lose consciousness. This is particularly important for systems using carbon dioxide only (in two phases), as it is a legal requirement for conscious birds not to be exposed to concentrations above 40%.

For tunnel systems, the installation of appropriately positioned windows at regular intervals along the entire length of the system can be sufficient to satisfy this standard, provided that the effect of the gas on birds can be clearly seen. Ideally, cameras should be installed, either to follow the birds through the system or at critical monitoring points. Where windows are used to monitor birds it may be necessary for them to be cleaned regularly to ensure visibility of the birds is maintained and thus the requirement is met at all times.

Calm induction to unconsciousness: The induction to unconsciousness must be calm, i.e. birds must not show any avoidable signs of fear or excitement, such as wing flapping or escape

behaviour.

Gas killing offers a number of potential welfare benefits over conventional water bath systems, including avoiding inversion and the shackling of conscious birds, and the elimination of problems associated with electrical stunning, such as pre-stun electrical shocks and ineffective stunning (EFSA, 2004b; FAWC, 2009; Humane Slaughter Association, 2005). To maintain this welfare advantage it is important that the induction to unconsciousness is calm. This has been highlighted by the UK's Farm Animal Welfare Council who suggested that as gas killing systems do not render birds immediately unconscious, induction to insensibility (i.e. unconsciousness) without avoidable pain or distress was a key requirement (FAWC, 2009).

During exposure to carbon dioxide poultry exhibit a number of behaviours; it is not clear and opinions vary on how to interpret some of these behaviours and this makes it challenging to understand the welfare impact from observation of these behaviours alone. Such behaviours include head shaking (McKeegan *et al.*, 2006; Gerritzen *et al.*, 2007; Sandilands *et al.*, 2011) and deep breathing and gasping (Gerritzen *et al.*, 2007). However, bird welfare is likely to be improved when these behaviours are performed less frequently. Generally, the presence of such behaviours can be considered of lower welfare concern compared to, for example, escape behaviours and conscious wing flapping, which should not be observed as they are indicative of poor welfare. The Welfare Ranking developed by Grandin (2013) rated gasping with continuous wing flapping from the time birds enter the gas until loss of posture as not acceptable, and where all birds flap continuously or attempt to climb out of the container from entering the gas until loss of posture as a serious problem.

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