Animal Welfare Standards Public Consultation
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To whom it may concern

Submission on draft *Australian Animal Welfare Standards and Guidelines for Poultry*

Thank you for the opportunity to contribute to the development of acceptable welfare requirements for poultry.

I wish to submit the attached comments on the draft Standards and Guidelines.

Regards

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PROPOSED DRAFT AUSTRALIAN ANIMAL WELFARE STANDARDS AND GUIDELINES FOR POULTRY

Public Consultation 26 February 2018

Draft Standard/Guidelines	Proposed amendment	Comment
SA1.1 A person must take reasonable actions to ensure the welfare of poultry under their care.	SA1.1 A person must take effective actions to ensure the welfare of poultry under their care.	The term “reasonable” is vague and open to interpretation.
SA1.2 A person involved in any part of poultry production must be competent to perform their required task, or must be supervised by a competent person.	SA1.2 A person involved in any part of poultry production must have recognised qualifications through a nationally accredited scheme.	Competency must be defined and quantified at a national level by way of a nationally accredited scheme to have any meaning. This standard must be rewritten to include the relevant industry training course/s and accreditation scheme/s.
SA2.1 A person in charge must ensure poultry have reasonable access to adequate and appropriate feed and water.	SA2.1 A person in charge must ensure poultry have effective access to adequate and appropriate feed and water.	Replace “reasonable” with as it is open to interpretation.
SA2.2 A person in charge must ensure poultry, other than newly hatched poultry or where skip-a-day feeding is acceptable (for broiler breeders) have access to food at least once in each 24 hour period.	SA2.2 A person in charge must ensure that all poultry including newly hatched poultry and broiler breeders have access to food ad libitum.	The practice of Skip-a-day feeding must be banned due to the cruelty involved, as broiler breeders have been genetically selected by farmers to always be hungry — then denied the very thing they've been bred to do. The independent review Farmed Bird Welfare Science Review, commissioned by the Victorian Government, states the “the evidence for these chickens suffering from chronic hunger is indisputable”(BB2.1), and that “one possible alternative to feed restriction, to improve welfare, is to use broiler breeder genotypes that can be fed ad libitum, or that require less feed restriction, and still maintain acceptable production (Jones et al., 2004; Decuypere et al., 2006).(BB 2.3A)” The Review found that feed restrictions cause welfare issues in Broilers with the “welfare benefits of feed restriction on health in fast growing broiler strains ... overshadowed by the broilers experiencing extended period of hunger”(B2.3) The Review supports immediate feeding for newly hatched poultry for example,” broiler chick mortality can be limited by immediate access to food and water at hatch”(B10) and for Ducks “Body weight was adversely affected by 48-hours deprivation and this difference was still observed when birds reached market age at 35 days old. The results suggest that delayed access to food and water initially affected the metabolism and may have caused dehydration, but also slowed the development of the small intestine.”(D2)

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		As the Review points out ad libitum feeding is already routine for layer hens" The nutrient requirements of laying hens have been well-established over many decades. Birds in all housing systems are usually fed ad libitum with rations that enable high egg production and satisfy hunger." (LH 2) and for ducks" In commercial housing, food and water are generally provided ad libitum."(D2) and this must be extended to all poultry to ensure that extended hunger from restricted diets are avoided.
SA2.3 A person in charge must ensure poultry, other than poultry less than 3 days old, have reasonable access to drinking water at least once in each 24 hour period.	Proposed SA2.3 A person in charge must ensure that all poultry have access to drinking water ad libitum.	The Farmed Poultry Review supports ad libitum water provision for poultry including newly hatched poultry for example "immediate access to food and water at hatch ...can all help limit first-week mortality."(B10) and " Sufficient drinkers should be supplied to enable all broilers, even those with limited mobility, to access water at all times, without competition"(B10) The Review also found that ad libitum provision of water is routine for layer hens "clean water is also generally available ad libitum in a manner that satisfies thirst."(LH 2) and for Ducks" In commercial housing, food and water are generally provided ad libitum."(D2), and this must be extended to all poultry as it is important that water access is not too restricted as water consumption is an important means of automatically monitoring flock health
GA2.12 Water within drinker lines should be regularly flushed and monitored.	Water within drinker lines must be flushed weekly and monitored	
SA3.1 A person in charge must take reasonable actions to protect poultry from threats, including extremes of weather, fires, floods, disease, injury and predation.	SA3.1 A person in charge must take effective actions to protect poultry from threats, including extremes of weather, fires, floods, disease, injury and predation.	Replace "reasonable" as it is open to interpretation.
SA3.3 A person in charge must ensure appropriate action for sick, injured or diseased poultry at the first reasonable opportunity.	SA3.3 A person in charge must ensure effective action for sick, injured or diseased poultry immediately upon identification.	Replace "as soon as possible" with "immediately" to ensure that suffering is minimised
SA3.4 A person must ensure poultry which are unable to access feed and water are treated or killed as soon as possible.	SA3.4 A person must ensure poultry which are unable to access feed and water are treated or killed are killed immediately upon identification.	Replace "as soon as possible" with "immediately" to ensure that suffering is minimised
GA3.2 Plans to minimise risks to poultry welfare should include: emergency	Plans to minimise risks to poultry welfare should include: emergency contact	

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contact details electrical power or systems failure breakdown or mechanical failure affecting feed, water, ventilation adverse weather — specifically, conditions that predispose poultry to heat or cold stress flood and fire insufficient supply of feed or water.disease outbreak or injury emergency killing and disposal other issues specific to the enterprise or poultry being managed	details electrical power or systems failure breakdown or mechanical failure affecting feed, water, ventilation adverse weather — specifically, conditions that predispose poultry to heat or cold stress flood and fire insufficient supply of feed or water.disease outbreak or injury emergency killing and disposal other issues specific to the enterprise or poultry being managed. Alarm systems during power or systems failure including mechanical breakdown or failure. Back-up generator power for feed, water, ventilation, heating, cooling, hatching systems.	
GA3.3 Poultry handling should be minimised during extremely hot weather.	Poultry handling must not occur during extremely hot weather.	The Review found for: -Layer Hens ”The thermal requirements of hens and their housing are long established. This has a so-called thermoneutral zone, usually around 20-25 °C. Above the thermoneutral zone, the bird needs to work to keep cool, eventually panting, which requires extra water consumption”(LH7.5), for Boilers**”** Rearing temperatures reflect thermo-neutral conditions (24 °C) and should be maintained for the entire grow-out period.”(B9.4) -Broiler breeders **”**the majority of broiler breeders will be housed within the temperature range required to keep them comfortably warm, the thermoneutral zone (20-25 °C).(BB7.2) -Ducks” The thermoneutral zone for optimal production of Pekin ducks is between approximately 8-22 °C (Cherry and Morris 2008). In a study on the effects of high environmental temperatures on ducks, it was found that a sudden 3-hour increase in brooder temperature from 19 to 37 °C resulted in an increased respiratory rate and body temperature (Zhu et al., 2014). They also found that some internal organs (liver, spleen, bursa of fabricius) were lighter when compared with a control group”, -Turkeys” Ambient temperature of 30 °C coupled with air velocity from 1.5-2.5 m/s represents an optimal combination of conditions for young turkey performance in experimental conditions (Yahav et al., 2008).” The findings are clear that for optimum welfare and maintenance of thermo-neutrality, poultry must not be handled in extremely hot weather.

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GA3.5 Adequate firefighting equipment should be available and maintained for all indoor housing systems.	Effective fire-fighting equipment must be available for all housing systems	
GA3.6 Sufficient inspections should be undertaken during which temperature, light levels, availability of feed, feeding systems, water and all parts of the ventilation system are checked, and where problems are encountered, appropriate remedial action should be taken to protect the welfare of poultry.	GA3.6 Sufficient inspections each day should be undertaken during which temperature, light levels, availability of feed, feeding systems, water and all parts of the ventilation system are checked, and where problems are encountered, appropriate remedial action should be taken to protect the welfare of poultry.	
GA3.17 Feather pecking and cannibalism risk should be managed. Management methods, such as the below may be considered: infrared beak trim at day old reducing light intensity providing foraging materials modification of nutrition and feeding practices reducing stocking density selecting the appropriate genetic stock isolation of affected birds.	Feather pecking and cannibalism risk should be managed. Management methods, such as the below must be considered: providing foraging materials enrichment. modification of nutrition and feeding practices reducing stocking density selecting the appropriate genetic stock isolation of affected birds.	Procedures on poultry of infrared beak trimming and reducing light intensity to control aggression must be banned and alternatives like increasing enrichment and reducing stocking density must be used instead. For example, to address aggression in layer hens the Review recommends ”good quality litter should be present during rear, with many studies showing that early feather pecking in chicks or young pullets is prevented or reduced by the provision of good quality litter substrates” (Huber-Eicher and Sebö, 2001b; Chow and Hogan, 2005; Bestman et al., 2009), that other enrichment be provided via the provision of hay bales (Daigle et al., 2014), pecking strings (Jones et al., 2000; McAdie et al., 2005), pecking objects (Moroki and Tanaka, 2016a) and pecking blocks (Holcman et al., 2008)” and the avoidance of using low light intensities as ”Long-term housing under low light conditions can provoke other welfare problems including eye problems, difficulties in judging flight distances and disruption of social recognition (reviewed in Nicol et al., 2013)” The Review recognises the role of enrichment in reducing aggression in Broiler breeders as “More injurious feather pecking (severe feather pecks and feather pulls) has been reported in broiler breeders kept entirely on slats than in birds housed on litter; this suggests that the availability of good quality litter for foraging diminishes the effects of stress associated with feed restriction, and that this undesirable behaviour will be minimised if good litter conditions are maintained (Hocking et al., 2005).” In relation to Turkeys, the Review recommends reducing stocking

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		densities to address aggression" Turkeys are often kept under very low light levels in an attempt to reduce injurious pecking but this may have other adverse welfare consequences. Aggressive interactions pose a greater threat to welfare in turkeys than most other farmed bird species. The turkey is a highly social bird, but can be aggressive in establishing dominance relationships and in competing for resources. High stocking densities can increase levels of aggression as birds are unable to move away from aggressors."(T9) Low light conditions are a serious welfare risk for poultry and must not be used to control aggressive feather pecking; -Layer Hens "Dim light, very short or long photoperiods, and continuous illumination, all adversely affect the development of the eye, and its ability to focus (Lewis and Gous, 2009). (LH 7.1). -Broilers "As with continuous or near-continuous lighting, many studies have shown that broilers reared under low lighting (0.5-1 lux) had larger heavier eyes (associated with choroid inflammation and apparent retinal degeneration) than birds reared under brighter light (10-200 lux), which could indicate impaired vision (Deep et al., 2010; 2013; Blatchford et al., 2009; 2012). -Ducks"Lighting within duck housing can have a huge impact on welfare and a range of wavelengths may be important for welfare. Ducklings prefer bright lighting conditions in the range of 6-100 lux and welfare may be adversely affected if ducks are kept in very low lighting (<1 lux).(D7.1) -Turkeys "While 2 week old poults significantly prefer environments of 200 lux, at 6 weeks they prefer illuminances greater than 6 lux for inactive behaviour such as resting and perching and illuminances greater than 20 lux for other activities (Barber et al., 2004). However, commercial units rarely use such high illuminances because of the increased risk of injurious pecking (Barber et al., 2004). Instead the light levels in some turkey houses may be below 1 lux. Such a poorly illuminated environment is highly unnatural and can lead to changes in eye morphology, often severe enough to result in partial or total blindness (Buchwalder and Huber-Eicher, 2004)."
GA3.18 Poultry should be monitored for incidence of lameness, and the cause of lameness investigated and treated.	Poultry must be monitored for incidence of lameness, and the cause of lameness investigated and treated immediately	

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	upon identification.	
SA4.4 A person in charge must ensure any slatted, wire or perforated floors are constructed to support the forward facing toes, prevent entrapment and facilitate removal of manure.	A person in charge must ensure only wooden slatted floors are constructed. Slatted floors must support the forward facing toes, prevent entrapment and facilitate removal of manure.	The Review reported that “Hyperkeratosis (thickening of the skin on the foot pad) is a common condition in commercial laying hens..” and “ Generally, the wire floors of cages are a risk factor for hyperkeratosis...“(LH3.8). It was found that” Wire or slatted floors enable droppings to pass through ....they are commonly used in cages and in raised areas of group housing. Plastic flooring appears to have negative effects in comparison with wire mesh flooring, being associated with reduced plumage quality (Whay et al., 2007; Heerkens et al., 2015) and higher mortality and prevalence of wounds (Heerkens et al., 2015)(LH3.8) and for Pheasants” As with laying hens, housing on wire floors presents a risk to foot health, and furthermore does not provide a suitable substrate for the ground pecking and beak digging behaviours associated with gamebirds, or for dust-bathing, which may result in frustration, as well as overgrowth of the beak, which would normally be worn down by these behaviours.”(PHS4.1). It was also suggested by the Review that plastic slats contributed to the high incidence of Foot Pad Dermatitis in broiler breeders,” Kaukonen et al. (2016) observed foot pad condition to deteriorate towards slaughter age in breeder hens, at which point the majority (64%) of birds had severe FPD lesions (scored 4 on a 5-point severity scale). FPD score was positively associated with litter moisture, pH, and percentage slatted area; interestingly, litter condition in breeder houses did not appear to fully explain foot pad deterioration, since the maintenance of dry, friable litter over the whole production period did not guarantee foot health (Kaukonen et al., 2016). Unlike broilers, the feet of breeders make contact with plastic slats in addition to litter, and the elevated slats are often used for roosting; bird mass, time spent on the slatted areas, and slat design may all be important factors in determining FPD prevalence and severity in broiler breeders.”(BB3.8a)
GA4.5 Provision of environmental enrichment should be considered, taking into account potential risks and benefits to poultry welfare. Such practices may include provision of: □ bales of hay or straw □	Provision of environmental enrichment must be provided, taking into account potential risks and benefits to poultry welfare. Such practices may include provision of: □ bales of hay or straw □	The Review found strong evidence for the need for enrichment in Poultry: -For Layer Hens ”Rearing pullets with appropriate enrichment discourages the development of feather pecking and helps to ensure that birds will be able to make full use of all facilities in the laying house as adults.(LH3.5),

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perches/barriers objects for pecking dust-bathing materials a radio in sheds to accustom poultry to a range of noises and voices.	perches/barriers objects for pecking dust-bathing materials a radio in sheds to accustom poultry to a range of noises and voices.	and “Reduced foraging opportunities appear to interact with high levels of bird fearfulness or stress to increase the overall risk of feather pecking. This interactive effect was demonstrated in a study by El-lethey et al. (2001) where birds housed on litter performed, as expected, less feather pecking than birds housed on slats. But if the litter-housed birds were directly fed corticosterone, increasing their plasma concentrations to levels seen under physiological stress, feather pecking rates increased significantly.”, and “The provision of ad libitum feed does not remove the hens’ need to engage in foraging behaviour. Indeed, in the presence of free food, hens may still choose to expend energy in a range of foraging behaviours, a phenomenon sometimes called contra-freeloading (Lindqvist and Jensen, 2008; 2009).” (LH4.3) -For Broilers “Broilers provided with hay bales are generally more active than control birds (Kells et al., 2001; Bailie et al., 2013; Ohara et al., 2015); The provision of wooden barrier perches stimulated some broilers to perch, in preference to lying on the litter (Bizeray et al., 2002b; Ventura et al., 2012) and, due to changes in the way that the birds used the available space, they also lowered aggression and disturbances (of resting individuals) compared to control environments (Ventura et al., 2012). The provision of sand trays can attract broilers into floor areas otherwise rarely used and promote increased foraging behaviour, but has no effect upon locomotor activity or tarsal deformities (Arnould et al., 2004). Although dust-bathing in broilers is rarely observed, they will perform this behaviour if given access to a suitable substrate, such as sand (Bokkers and Koene, 2003a; Shields et al., 2004). Broilers were observed to perform more dust-bathing in sand, and spent a greater proportion of their total time located within an area containing sand, than in areas containing rice hulls, paper, or wood-shavings; no dust-bathing was seen to occur in rice hulls (Shields et al., 2004). Dust-bathing has been reported in broilers as old as 12 weeks (Bokkers and Koene, 2003a), demonstrating that this natural behaviour is still possible despite a heavy body mass.” -For Broiler Breeders “As for layers, broiler breeders should be provided with perches from an early age to meet the behavioural needs of the birds, to assist in the development of mobility and spatio-cognitive skills (ability to navigate through a three-dimensional environment), to assist in accessing resources, and to maximise the potential use of elevated structures during the production period (i.e. perches, platforms and raised nest-boxes). The opportunity to learn perching behaviour during rearing appears to influence

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		laying and nesting behaviour in broiler breeders. Brake (1987) observed that breeder hens reared in the presence of perches exhibited a significantly reduced incidence of floor-laid eggs compared with hens reared without perches. Providing broilers with elevated enrichment, including straw bales and perches, has been shown to encourage increased physical activity, stimulate a greater variety of motor patterns, and improve leg health (see B5.6). European legislation concerning minimum standards for the protection of laying hens states that adequate perches should be provided in enriched cages as well as in alternative systems for laying hens (AHAW, 2010), and there is every reason that similar recommendations should also apply to broiler breeders."(BB4) -For Turkeys "The provision of low-level perches or elevated platforms should be considered as a means of satisfying roosting motivation, particularly in younger birds."(T9)
GA4.8 Poultry should have enough vertical and horizontal space available to stretch to their full height and flap their wings.		We demand an immediate phase out of cage production systems and removal of standards and guidelines related to cage systems. The Review unequivocally found that, for example with layer hens,"The conventional cage (CC) system prevents birds from performing basic movements essential for good health (walking, wing stretching), and denies birds the possibility of expressing their behavioural needs to roost, nest and forage, or their motivation to dust-bathe, due to an inherent lack of resources. Lack of exercise weakens bones which are likely to fracture during depopulation, and leads to metabolic conditions such as haemorragic fatty liver syndrome. Claw breakage, plumage abrasion and poor foot health are also features of CC systems. ...The welfare problems associated with CCs are substantial..."(LH11)
GA4.10 Where poultry are brooded on wire, temporary supportive flooring material, such as paper or matting, should be provided during the early brooding period.		Poultry should not be brooded on wire
GA4.11 If perches are provided they should be designed and fited to reduce the risk of vent pecking.	Perches must be designed and fitted to reduce the risk of vent pecking.	Review identified a highly motivated need to perch exists amongst poultry and therefore must be provided for poultry. - For Layer Hens,"In non-cage flocks it would seem beneficial to allow

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		highly-motivated night-time roosting on elevated structures, but these may be achievable by providing appropriately-designed grids, ramps and platforms that do not necessarily fit the common image of a “perch” but that do minimise risks of injury and fracture (Stratmann et al., 2015a; Heerkens et al., 2016a; Pettersson et al., 2017).(LH 4.2D),”Provision of perches also reduces later problems with feather pecking (Gunnarsson et al., 1999; Huber-Eicher and Audigé, 1999) possibly because birds learn how to avoid trouble-makers by moving in three dimensions.”(LH 9), -For Boiler Breeders” Further benefits of promoting perching and roosting include reduced contact between the skin and the litter and better distribution of birds vertically within the available space, allowing better circulation of air and improving ventilation of the litter surface. Results regarding the influence on elevated structures and contact dermatitis are variable and are likely to reflect different uptake in perch use between studies. Perch provision has been associated with less FPD (Ventura et al., 2010; Hongchao et al., 2013; Kiyma et al., 2016). As for layers, broiler breeders should be provided with perches from an early age to meet the behavioural needs of the birds, to assist in the development of mobility and spatio-cognitive skills (ability to navigate through a three-dimensional environment), to assist in accessing resources, and to maximise the potential use of elevated structures during the production period (i.e. perches, platforms and raised nest-boxes). The opportunity to learn perching behaviour during rearing appears to influence laying and nesting behaviour in broiler breeders. Providing broilers with elevated enrichment, including straw bales and perches, has been shown to encourage increased physical activity, stimulate a greater variety of motor patterns, and improve leg health (see B5.6). European legislation concerning minimum standards for the protection of laying hens states that adequate perches should be provided in enriched cages as well as in alternative systems for laying hens (AHAW, 2010), and there is every reason that similar recommendations should also apply to broiler breeders.(BB4.2) - For Turkeys ”However, when perches are provided, the use of elevated levels as a perching place was significantly higher in the dark periods (Berk and Hahn, 2000) suggesting that commercial turkeys will use perches or elevated levels to roost. While a reduction in motivation to perch as age increases cannot be discounted (Martrenchar et al., 2001),

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		evidence that older birds will still climb on to straw bales or use wider, lower perches suggests that the motivation persists with age (Sainsbury and Sherwin, 2001). It seems to be the physical constraints imposed by the heavy weight of modern strains that restricts the use of perches in commercial turkeys (Bessei, 1999, cited by Martrenchar et al., 2001)."(T4.2)
GA4.12 Where used perches should be designed and located to minimise the risk of injury when mounting or dismounting perches.	Perches must be designed and located to minimise the risk of injury when mounting or dismounting perches.	Review identified a highly motivated need to perch exists amongst poultry and therefore must be provided for poultry
Nests GA4.15-4.17	reflect the findings of the Review which identified a highly motivated need to perch exists amongst poultry and therefore must be provided for poultry;	-For Turkeys," Wild turkey hens build nests on which to incubate and raise their chicks. An experimental study comparing incubation behaviour and hormonal parameters in turkey hens exposed to different rearing environments (battery cage without a nest box, individual floor pens with a nestbox and group floor pens with nestboxes), found that environment had a significant influence on both hormones and incubation behaviour (Bédécarrats et al., 1997). The hens housed in the group pens expressed higher levels of incubation behaviour, higher prolactin levels and laid more eggs in their nestboxes and the authors hypothesised that the greater visual and tactile exposure to eggs and nestboxes may have facilitated this difference (Bédécarrats et al., 1997). Empirical evidence on turkeys' need for a nest appears to be lacking. However, given that wild turkey hens place considerable importance on nest site and that experimental studies have demonstrated that turkey hens will use nest boxes if they are provided, this would indicate that turkey breeder hens should have access to some form of nest."(T4.1) -For Layer Hens" There is an internal component to nesting motivation such that, approximately 1-2 h before oviposition, hens become increasingly active and restless and start to search for a suitable nest site. Potential nest sites are inspected closely before one is chosen for nesting and egg laying. Whilst nesting, hens alternate between sitting and (vestigial) nest building activities such as turning, floor scratching, and manipulating potential nesting materials such as pieces of straw. If such highly preferred substrates are absent, then almost any material will be pecked at and placed around the body. Hens have preferences for nests

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		that can be moulded by their own bodies, but they will accept pre-formed nests, provided these permit some of the nest building activities mentioned above (Duncan and Kite, 1989). The majority of hens sit in the nest for between 17 and 25 min before oviposition (Cronin et al., 2005; Hunniford and Widowski, 2016), with total time spent in nests ranging from 23 to 65 min (Heinrich et al., 2015). Many studies have shown that hens have a high motivation to access a preferred nest, particularly as the sitting phase approaches, and this motivation has been measured by observing hens squeezing through narrow gaps (Cooper and Appleby, 1996) or pushing through weighted doors (Cooper and Appleby, 2003). In this latter study, at approximately 20 minutes prior to oviposition, hens worked at a higher rate for nest access than is seen for access to feed (after a 4 hour deprivation period)." -For Broiler Breeders" Broiler breeders appear to be motivated to nest within nest-boxes so a sufficient number of an appropriate design should be provided. Very few studies have been conducted on nesting behaviour in broiler breeders. Laying hens demonstrate a strong innate motivation to nest (see LH4.1), and it is safe to assume that breeders share the same drive to lay their eggs within a suitable nest site with minimum stress for the sitting hen (i.e. away from flock-mate disturbances)."(BB4.1) -For Ducks" Ducks prefer to lay their eggs in enclosed boxes with a roof and an entrance curtain. The presence of another egg also increases the likelihood of ducks laying within a nest box. Most nesting birds however chose a secluded and safe position to lay eggs. In an experimental study, it was found that ducks significantly prefer enclosed nest boxes, opting for those with a closed top and an entrance curtain (Makagon et al., 2011)."(D4.1)
GA4.15 Where nests are provided, they should provide seclusion from the flock and should be of adequate size and number to meet the laying needs of all poultry, and ensure poultry can lay without undue competition.	Nests must be provided to provide seclusion from the flock and should be of adequate size and number to meet the laying needs of all poultry, and ensure poultry can lay without undue competition.	

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SA6.1 A person in charge must ensure that the light intensity on poultry must be adequate to allow poultry and equipment to be inspected and any problems to be identified. SA6.2 A person in charge must ensure that the light intensity for young poultry for the first 3 days after hatching is at least 20 Lux. SA6.3 A person in charge must ensure that the light intensity for poultry is at least 5 Lux on average during light periods.	A person in charge must ensure that the light intensity for poultry is appropriate for each species	The Review found that a minimum of 5 lux during light periods was inadequate for certain poultry species for example: **-**For Boilers **"**Continuous or near-continuous lighting, and dim illumination (<10 lux) during the lights-on period, have negative effects on broiler behaviour and health;"(B8.1) and "Birds raised under dim lighting (5 lux) demonstrate pronounced dispersal of inactive and active behaviours over the entire photoperiod and lack behavioural synchronisation, presumably due to the low light-dark contrast between the scotophase and photophase having dampened their behavioural rhythms (Alvino et al., 2009a; Blatchford et al., 2009; 2012)." (B8.1b) -For Boiler Breeders "Because laying hens and broiler breeders are fundamentally biologically similar, it can be assumed that very low light intensity will also affect these behaviours in broiler breeders. Light intensities of 20-40 lux may be used for non-beak-trimmed birds, to prevent injurious pecking. Lewis et al. (2009) verified that these recommendations were appropriate for non-cage systems; they determined biological optima for egg production as 15 lux during rear and 7 lux in the laying period; hens illuminated at 25 lux in the laying period laid more floor eggs than at either 55 or 70 lux. (BB7.1) - Within the EU, lighting requirements state that a light intensity of at least 20 lux during the light phase must be provided at all ages, boilers.(insert reference): -For Turkeys"Turkey poults show a preference for different light environments at different ages and for different behaviours (Barber et al., 2004). While 2 week old poults significantly prefer environments of 200 lux, at 6 weeks they prefer illuminances greater than 6 lux for inactive behaviour such as resting and perching and illuminances greater than 20 lux for other activities (Barber et al., 2004). However, commercial units rarely use such high illuminances because of the increased risk of injurious pecking (Barber et al., 2004).(T7.1) -For Ducks" The provision of natural light (in addition to artificial light) within housing is ideal, but if not possible, a range of light intensities should be provided. Ducks showed a preference for at least 6 lux."(D11)
SA6.5 A person in charge must ensure poultry except for meat chickens, emus,	A person in charge must ensure all poultry including meat chickens, emus, ostriches	The Review provided strong evidence for a minimum of 8hrs dark for poultry for example:

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ostriches and quail are exposed to at least 4 hours of continuous darkness within a 24 hour period.	and quail are exposed to at least 8 hours of continuous darkness within a 24 hour period.	-For Broilers ”an appropriate photoperiod (e.g. 16 hours of light:8 hours of dark at 20 lux) from the second week, should encourage activity and benefit leg health.” (B10) and ”An 8 h scotoperiod generally appears to be associated with low fear levels. Fearfulness has generally been found to be higher under continuous or near-continuous light than under constant light (16L:8D) (Sanotra et al., 2002; Onbaşilar et al., 2008; Bayram and Özkan, 2010; Toplu et al., 2016)., Leg health, leg bone quality and FPD benefit from a longer scotophase (see B3.3g and B3.4a). Lewis and Gous (2009) report a negative linear relationship between eye weight and photoperiod (2-21 h light). Heavier eyes (macrophthalmia) are also reported in continuously illuminated birds (Lewis and Gous, 2009; Schwean-Lardner et al., 2013). These results indicate that normal ocular development in broilers requires a maximum photoperiod of 20 h and that short photoperiods, in addition to continuous illumination, may be harmful for eye health., Bayram and Özkan (2010) also observed that birds maintained under a 16L:8D photoperiod displayed greater sociality (as assessed by social reinstatement runway tests), compared to birds exposed to continuous lighting.” (B8.1) -For Turkeys “Day length can influence behaviour, the incidence of skeletal abnormalities, mobility, growth and eye health, and so ultimately the welfare of domestic birds (Vermette et al., 2016). Day length still has an impact, even when lighting programs are maintained at low light intensities (2 lux) (Vermette et al., 2016). Day length has a more pronounced effect on the welfare of toms than hens, but linear effects on mobility, breast blisters and altered eye size were noted for both toms and hens in one study that considered daylengths of 14 to 23h (Vermette et al., 2016). Behaviour was only measured in toms, but the reduction in active behaviours and increase in resting suggests that the toms were experiencing lethargy and a lack of ability or motivation to perform some behaviours with increasing day length (Vermette et al., 2016).”(T7.1)
GA6.2 Chicks up to 7 days old should have a maximum light period of 23 hours in a 24 hour period		.All chicks must have at least 8 hrs of dark.
GA7.1 Rapid changes in temperature should be avoided where possible.	Rapid changes in temperature must be avoided where possible and monitored via alarm systems.	

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SA8.1 Where litter is used, a person in charge must ensure litter material is suitable for the species and of a good quality.	Litter must be used for all poultry. A person in charge must ensure litter material is suitable for the species and of a good qualit	The Review provides strong evidence for the mandatory provision of litter to meet the behavioural needs of poultry thus reducing aggression as well as to reduce health issues: -For Laying chickens “EC rules specify at least 0.025 m2 of littered area per hen with at least one third of the floor area being litter (1999/74/EC). Reduced foraging opportunities appear to interact with high levels of bird fearfulness or stress to increase the overall risk of feather pecking.Ideally good quality litter should be present during rear, with many studies showing that early feather pecking in chicks or young pullets is prevented or reduced by the provision of good quality litter substrates (Huber-Eicher and Sebö, 2001b; Chow and Hogan, 2005; Bestman et al., 2009).” “Injurious severe feather pecking is a highly prevalent problem that results when normal exploratory or foraging pecking is directed towards other birds. Ideally good quality litter should be present during rear, with many studies showing that early feather pecking in chicks or young pullets is prevented or reduced by the provision of good quality litter substrates (Huber-Eicher and Sebö, 2001b; Chow and Hogan, 2005; Bestman et al., 2009). Foraging materials were significantly more effective in reducing feather pecking than other enrichments such as dust-bathing substrates, or novel objects (Dixon et al., 2010).”(LH3.5b) -For Broilers “Although sand is a ‘preferred’ substrate for performing dust-bathing and comfort behaviours, wood-shavings are a suitable alternative litter-type. When given a choice between sand and wood-shavings as litter, broilers increasingly performed the majority of their total behavioural time budget on sand (including preening and dust-bathing) (Shields et al., 2005; Toghyani et al., 2010), but if only one litter-type was provided (sand or wood-shavings) they performed all behaviours on either material with similar frequency (Shields et al., 2005),”Broilers reared on chopped straw had a reduced incidence and severity of FPD dermatitis compared to broilers reared on, less-absorbent, unchopped straw (Đukić Stojčić et al., 2016). Wood-shavings appear to be the most appropriate litter bedding type for controlling FPD; flocks reared on wood-shavings or sawdust exhibit less FPD (prevalence and severity) than those reared on chopped straw (Su et al., 2000; Meluzzi et al., 2008a; Berk, 2009; Bilgili et al., 2009; Nowaczewski et al., 2011; Kyvsgaard et al., 2013; Skrbic et al., 2015), rice husks (Petek et al., 2014; Jacob et al., 2016a), grass (Xavier et al., 2010;

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		Garcia et al., 2012), or corncob litter (Xavier et al., 2010). -For Turkeys ”In commercial systems, the investigative and foraging behaviour of turkeys appears to be almost entirely beak based, rather than the ground scratching observed in other poultry species and in wild turkeys (Hughes and Grigor, 1996). Although environmental pecking reportedly decreases with age (Sherwin and Kelland, 1998), foraging does appear to be a highly motivated behaviour. Indeed, turkeys given access to a pasture on which to forage spend most of their time grazing (Karabayir et al., 2008). Lack of foraging opportunities in commercial systems has been associated with the performance of injurious pecking (Dalton et al., 2013).”(**T4.3) and “**When provided with appropriate conditions, for example, fresh shavings, domestic turkeys will engage in dust-bathing (Sherwin and Kelland, 1998) and this behaviour appears to be socially facilitated (Sainsbury and Sherwin, 2001). It is likely that turkeys are unable to perform this behaviour in typical commercial systems due to the formation of a non-friable crust on the litter”(**T4.4)**
SA9.3 A person must free entrapped poultry at the first reasonable opportunity and if possible prevent this situation from recurring.	A person must free entrapped poultry without delay and prevent this situation from recurring.	
SA9.6 A person in charge must ensure that poultry induced to moult are: 1) in adequate physical condition to endure another lay cycle; and 2) not deprived of feed or water; and 3) not fed a high fibre/low energy diet for longer than 20 days or body weight loss of no more than 25%; and 4) provided with a calcium supplement.	Remove SA 9.4-9.6, a complete ban on Induced Moulting is demanded	“The practice of moulting hens by removal or restriction of feed causes severe welfare problems of bird hunger, stress and unacceptable levels of mortality. These problems are not reduced or mitigated by feeding low-nutrient diets. Modern strains of laying hen are now available with increased durations of the first laying cycle (90 weeks or more) greatly reducing any perceived need to moult. Reduced egg production towards the end of the first laying cycle can occur due to fat deposition and lack of exercise, but this is primarily a problem associated with CC systems. There are no welfare benefits that could outweigh the welfare costs of this practice.” The Review clearly acknowledges the severe welfare issue of forced moulting as “a consequence of keeping birds in conventional cages where they cannot exercise and become over-fat.”.Therefore a complete ban on moulting must be adopted in the Standards with a mandatory move away from conventional cages to non-cage systems that allow birds to

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		exercise.The Review also notes that ”the emergence of new strains of laying hens with longer productive first laying cycles (Bain et al., 2016) should see forced moulting become a redundant practice. In the UK many farmers are now depopulating flocks at 80 to 90 weeks, rather than 65-72 weeks as in the recent past.”(LH8.3c)
SA9.9 A person must not perform desnooding or dubbing for cosmetic purposes on poultry.	A person must not perform desnooding, dubbing, despurring, toe trimming and web marking on poultry unless under veterinary advice	Painful procedures on poultry including the surgical removal of the snood of turkeys, the removal of combs of layer hens and despurring of male broiler breeders must be banned and non-invasive management strategies must be used like provision of adequate space for poultry species to escape aggression, the use of enrichment to minimise aggression and genetic selection.The Review provides evidence of the welfare costs from procedures for example; - For Hens“In Europe pullets are not subjected to comb or wattle trimming (“dubbing”). However, in the USA, up to 19 million pullets have their combs trimmed to improve production efficiency, as trimmed birds consume marginally less food. Apart from the likely pain caused by cutting an enervated tissue, comb trimming reduces the ability of hens to thermoregulate during hot weather. During and after a 50 h period at 34.6 °C, comb-trimmed birds showed greater signs of heat stress (panting and wing spreading) and highly significantly increased mortality in comparison with controls (Al Ramamneh et al., 2016).(**LH8.3d)** - For Turkeys”Prior to moving from commercial hatcheries, turkey poults undergo a number of procedures before being placed in rearing facilities. The poults are sexed, and then depending on the requirements of the rearing facility, they have their beaks and toes trimmed, their snood removed (males only) and are injected with nutrients and/or medications before being held without food or water prior to placement. The combined effect of these procedures is stressful (Donaldson et al., 1991; 1994) and there is likely to be significant pain associated with beak trimming, toe trimming and snood removal. **(T8.2a)** - **For Boiler Breeders”**Toe clipping and de-spurring are carried out on males to prevent the inside claws and spurs from causing feather damage and severe skin lesions to the females during mating; de-spurring also reduces the risk of damage to other males during fighting. Toe clipping

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		may also be utilised for identification of grandparent chicks (AHAW, 2010). Although some of these mutilations may have long-term benefits, the procedure will, at least transiently, compromise bird welfare. Removal of toes (usually the toe that points backwards or inwards) is performed using a hot blade or hot wire, while de-spurring is carried out by thermo-cautery (holding the spurs against a hot metal surface). Even brief physical restraint can elevate underlying fear levels in broilers (Marin et al., 2001), while the mutilation itself will induce acute and/or chronic pain since these tissues are well innervated (Gentle and Hunter, 1988). De-toeing may lead to the formation of small neuromas, the welfare implications of which are difficult to predict (Gentle and Hunter, 1988) although, if associated with chronic discomfort, may impact upon perching behaviour. No studies describe the long-term impact of de-toeing or de-spurring on male chicken welfare. If improvements in housing conditions, management or genetic breeding programmes can alter male breeder mating behaviour then the requirement for mutilations may become redundant.(**BB8.4b) and "**Mating aggressiveness also appears to have genetic origins and could be targeted in breeding programmes. If this could be decreased then the requirement to mutilate would also be lessened. The provision of environmental enrichment may prove beneficial in the short-term. The ratio of male to female birds must also be considered. Males and females are routinely beak trimmed to reduce injurious pecking, while males are often subjected to additional mutilations, such as toe and spur removal, to limit the physical damage inflicted upon other males and females. However, these procedures are conducted in the absence of good quantitative evidence about their potential beneficial effects.(BB9) - For Turkeys "microwave claw processor (MCP), is the industry's response to the risk of downgrades from scratching (Fournier et al., 2014). ...".”It has been suggested that (for broilers) the pain caused by toe-trimming early in life may be outweighed by the chronic pain the birds would have endured later in life from lacerations and subsequent infections that would have resulted from the toes and claws of the other birds if these had not been removed (Wang et al., 2008). However, no evidence on the prevalence of such lacerations was presented to support this opinion. ..." "In the longer term (133 days post-procedure), there was behavioural evidence that while the trimmed birds did not appear to be in pain they were more reluctant to walk perhaps due to instability resulting from the

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		removed toe tissue impairing their balance (Fournier et al., 2015). Research on heavy toms suggests that feed consumption and consequently body weight, and the incidence of rotated tibiae can be negatively affected by MCP toe trimming, while no positive effect on carcase scratches was detected (Fournier et al., 2014). In light of these combined findings, the expense and negative welfare impact of trimming does not appear to be compensated by improved productivity and carcase quality (Fournier et al., 2014)"(T8.2) **-**For Ostriches**"** De-clawing is a practice that is permitted primarily to reduce skin damage and improve the quality of ostrich leather products (it may also reduce the risk of injury to human handlers). From a welfare perspective de-clawing is a major and substantial concern. Given the high enervation of the toe region, the removal of toes with a hot blade without analgesic or anaesthetic provision, is likely to cause severe pain, at least over the short-term. Research should be conducted on strategies to reduce skin damage in other ways (e.g. by ensuring stable and compatible groups of birds, ensuring low competition for resources, providing areas of abrasive flooring to blunt claws naturally) and on improved handling practices so that de-clawing is no longer (as in some other countries) deemed a necessary practice.(OS9) -For Emus "As for ostriches, de-clawing may be practiced to reduce skin damage and reduce risk of injury to human handlers. The comments given for ostriches on the welfare impact of this practice apply also to the emu. In addition, unlike for the ostrich, the effect of de-clawing on skin damage does not appear to have been quantified (at least in the scientific literature) and so it is not possible to assess the balance of harm against benefit.(EM7)
SA9.14 A person must use appropriate tools and methods to trim the beaks of poultry. SA9.15 A person must not remove more than one-third of the upper and lower beaks.	A person must not perform beak trimming unless under veterinary advice.	The Review acknowledges the serious negative welfare outcomes of painful surgical procedures like de beaking. The Review sets out clear evidence for alternatives to beak trimming including provision of foraging material appropriate to each species and genetic selection and improved management to reduce prevalence of feather pecking for example; -For layer hens "Absent or poor-quality litter is thus a major risk factor for injurious pecking (IP) (Huber-Eicher and Wechsler, 1998; Nicol et al., 2001), with an inverse relationship seen between time spent foraging on

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		harmless substrates and time spent feather pecking (Klein et al., 2000). Reduced foraging opportunities appear to interact with high levels of bird fearfulness or stress to increase the overall risk of feather pecking. This interactive effect was demonstrated in a study by El-lethey et al. (2001) where birds housed on litter performed, as expected, less feather pecking than birds housed on slats. But if the litter-housed birds were directly fed corticosterone, increasing their plasma concentrations to levels seen under physiological stress, feather pecking rates increased significantly. The important link with foraging has implications for considering feeding practices to reduce the risk of injurious pecking."(LH3.5) and "Ideally good quality litter should be present during rear,many studies showing that early feather pecking in chicks or young pullets is prevented or reduced by the provision of good quality litter substrates (Huber-Eicher and Sebö, 2001b; Chow and Hogan, 2005; Bestman et al., 2009)."," Foraging materials were significantly more effective in reducing feather pecking than other enrichments such as dust-bathing substrates, or novel objects (Dixon et al., 2010)."(LH 3.5b) -For Boiler Breeders" Mating aggressiveness also appears to have genetic origins and could be targeted in breeding programmes. If this could be decreased then the requirement to mutilate would also be lessened. The provision of environmental enrichment may prove beneficial in the short-term. Elevated structures and vertical panels in particular would provide cover and offer a means for subordinate males or females to escape conflict and unwanted sexual attention. The ratio of male to female birds must also be considered."(BB9) -For Ducks" Bill trimming should be avoided unless absolutely necessary. Studies have shown that trimming reduces bill use for up to one week. This suggests the procedure causes pain. Alternative strategies to reduce inter-bird pecking damage including the provision of opportunities for natural foraging behaviour can be implemented to avoid the need for bill trimming."(D11) -For Turkeys" It has been suggested that beak trimming itself may lead to the development of feather pecking as the birds become frustrated over their impaired ability to grasp feathers and become highly motivated to continue the behaviour until the pecking and pulling action is complete (Dalton et al., 2013). As in chickens, there is also the risk that beak trimming will lead to the development of chronic pain in beak trimmed

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		birds."(T8.2a) -"broilers are not, generally, at risk of injurious pecking."(B10)
SA9.16 A person must not use blinkers or contact lenses on poultry unless under veterinary advice.	A person must not use blinkers or contact lenses on poultry.	Given the high welfare implications from the use of Spectacles and Bits, the Review recommends the use of alternatives to reduce aggression for example; -For Pheasants" Conversely the long term effect on biochemical indices of stress was greater for pheasants fitted with spectacles than for beak trimmed pheasants. It may be that while beak trimming is more invasive and painful in the short term, feeding and pecking behaviour adapts, thus the long term impact is less than in the case of fitting spectacles, where vision continues to be impaired for the duration of the laying period.(PHS5.2a),"Feather pecking and cannibalism present a significant welfare problem. While the methods employed for reducing or preventing these behaviours in pheasants appear to be effective, they have significant welfare implications in their own right. Consequently it would be preferable if beak trimming, and fitting spectacles and bits were used only as a last resort. In the first instance welfare could be improved by reducing the risks of feather pecking by other methods, such as appropriate levels of fibre and protein in the diet, minimising stocking density and using sight barriers in open pens. Farmers may also consider the management techniques suggested for reducing injurious pecking in laying hens.(PSH6) -For Partridges"As for pheasants, partridges may be fitted with beak bits to prevent feather pecking. It is likely that partridges experience the same negative welfare consequences of bitting as pheasants. Beak bits have also been associated with beak infection and necrosis which reduces welfare." As with laying hens and pheasants, partridges perform feather pecking behaviours, and like those species various methods of preventing or reducing the effects of feather pecking are routinely used. As for pheasants, beak bits may be fitted to partridges to prevent them fully closing their beaks and thus reduce the damage they are able to cause through feather pecking. Various negative welfare consequences of fitting bits to pheasants are outlined in the pheasant section (PHS5.2a); less work has examined the effects of bitting in partridges, although it is not unreasonable to assume the consequences may be the same."(**PTR6.4)**
SA9.18 A person must monitor incubators	A person must monitor incubators at	

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at regular intervals during hatching and hatchlings that are found outside the trays must be returned to the tray or placed in brooders as soon as possible.	regular intervals during hatching and hatchlings that are found outside the trays must be returned to the tray or placed in brooders without delay.	
SA9.20 A person in charge must ensure cull or surplus hatchlings awaiting disposal are treated humanely and are killed as soon as practicable.	A person in charge must ensure cull or surplus hatchlings awaiting disposal are treated humanely and are killed without delay.	
GA9.6 Mechanical catchers, where used, should be designed, operated and maintained to minimise injury, stress and fear to the birds. A contingency plan is advisable in case of mechanical failure.	Mechanical catchers must be used instead of Manual catchers.Mechanical catchers must be designed, operated and maintained to prevent injury, stress and fear to birds.A contingency plan must be available in case of mechanical failure.	The Review found that manual catching has extreme welfare implications for poultry.For Boilers" manual catching very stressful, most likely associated with being hung in an inverted position; mechanical catching offers the potential for reduced stress and injuries in broilers. Mechanically catching broilers with a sweeper-type catching machine under commercial conditions has been found to significantly reduce the number of injuries, especially leg injuries, compared with manual catching (Knierim and Gocke, 2003)."(B9.5) and for Turkeys" As for broilers, there is evidence that automated catching can reduce damage to turkeys and that it is a less stressful procedure than manual catching (Prescott et al., 2000).(T8.2E)
GA9.7 Poultry that are identified as unfit or injured before or during the catching procedure should be humanely killed immediately.	Poultry that are identified as unfit or injured before or during the catching procedure must be killed immediately, in accordance with species specific Standards in Part B.	
GA9.14 If therapeutic beak trimming is required, it should be carried out by trained and skilled personnel, at as early an age as possible and care should be taken to remove the minimum amount of beak necessary using a method which minimises pain and controls bleeding.	Therapeutic beak trimming must only be carried out under veterinary advice. It should be carried out by personnel accredited under a nationally recognised scheme, within three days of hatching and care must be taken to remove the minimum amount of beak necessary using a method which minimises pain and controls bleeding.	
GA9.17 Alternative strategies for inducing moulting that minimise the need for feed restriction should be explored.		Induced moulting must not be permitted under any circumstances
GA10.2 Acceptable methods should be		Low atmospheric stunning recommended.

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used for the humane killing of poultry…		Low atmospheric pressure stunning benefits poultry because they do not have to be disturbed, handled or removed from the crates in which they were transported. No direct contact needs to be made with the birds. A second advantage of LAPS is that its effectiveness is relatively insensitive to variations in bird size and conformity so stunning and killing can be achieved in 100% of birds with a high degree of certainty. Typical pain related behaviour, such as active escape/withdrawal, guarding, sick-bird posture, freezing and vocalisation are not seen in LAPS (Martin et al., 2016a). There is no known direct indicator for pain in chickens (EFSA, 2013), but Martin et al. (2016b) suggest that the slow wave EEG observed in broilers held in darkness under LAPS indicates that they are not in pain. Even in darkness, a desynchronisation of the slow wave EEG (resembling waking from sleep) is observed when chickens are given an aversive sensory stimulus (Gentle, 1975). Martin suggests that the absence of any such desynchronisation indicates the absence of sensory stimulation, such as pain or discomfort. Gas or controlled atmosphere stunning are another recommended method. Controlled atmosphere stunning and gas benefits poultry because they do not have to be disturbed, handled or removed from the crates in which they were transported. This may be particularly beneficial to end-of-lay hens which are likely to have brittle or broken bones (Knowles and Wilkins, 1998), and for birds that react strongly to handling, such as geese. Effectiveness is relatively insensitive to variations in bird size and conformity so a properly set up system does not need adjustment to suit different flocks, neither does it underperform when presented with flocks with a large variance in bird size. Recovery can be avoided with a high degree of certainty without compromising meat quality by ensuring the final gas concentrations are applied at a high enough level and for a long enough time. Farmed Bird Welfare Science Review, October 2017. Cervical dislocation not to be carried out without prior stunning. - Standard. Cervical dislocation should not be carried out without prior stunning as it is unlikely to cause immediate unconsciousness, and is likely to cause severe pain and distress (Erasmus et al., 2010)

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		Electrical stunning to be phased out (earlier for geese, turkeys and laying hens). – Standard. Animal welfare concerns include; the shackle is likely to put pressure on the legs causing pain, the birds are at risk from painful pre-stun electric shocks as they approach the water-bath, wing flapping due to these stresses can result in broken wings, agitated birds may occasionally struggle and avoid being electrically stunned, and the electric current delivered to each bird varies and so some birds may not be adequately stunned. Birds suffering from disease or abnormalities of leg bones or joints (Danbury et al., 2000). Male birds (which usually have thicker shanks) struggle sooner and longer than female birds, suggesting that the thicker the shank and the greater the compression, the more distress is experienced (Satterlee et al., 2000). Agitated birds can sometime flap their wings and avoid making any contact with the water-bath. They would therefore be bled while conscious. The large weight of turkeys suggests that they will be handled less smoothly and with less control. Geese are frequently very difficult to handle and flap violently. Laying hens are likely to have brittle or broken bones (Knowles and Wilkins, 1998). End-of-lay hens (also known as spent hens) may suffer from brittle bones, and are susceptible to injury if caught, transported and shackled for slaughter (Knowles and Wilkins, 1998). Estimates of the number of end-of-lay hens presenting with broken bones varies with breed and with the housing and catching method. The percentage of birds sustaining broken bones may be as high as 30% (Gregory and Wilkins, 1989b). Shackles take the form of metal bars formed to create tapered slots for each leg. Hanging from these shackles compresses and strains the legs and joints. Sparrey (1995) reports that forces of five or ten times the birds' weight are frequently used to pull the birds into the tapering gap of the shackles resulting in severe compression of the bird legs by forces of around 180 N. If using electrical stunning birds and equipment must be continually monitored to measure the average current levels and ensure the birds are stunned before bleeding out. Single sex flocks of a similar size should be killed at the same time. Breast support conveyer and compliant shackles which conform to the size of a bird's legs. When using electrical stunning birds should only be shackled for 1 minute. – Standard. Stunning current variation between individuals on the line can be reduced,

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		but not eliminated, by processing single sex flocks of a uniform size. When killing turkeys breast support conveyer and compliant shackles which conform to the size of a bird's legs should be used. (Lines et al., 2011; 2012). The need to shackle and invert live and conscious birds is a significant welfare concern. For chickens, the process of handling, inversion and shackling is stressful (Debut et al., 2005; Bedáňová et al., 2006; 2007; Fidan et al., 2015), and for some other birds the situation is worse. The large weight of turkeys suggests that they will be handled less smoothly and with less control. Geese are frequently very difficult to handle and flap violently. Laying hens are likely to have brittle or broken bones (Knowles and Wilkins, 1998). Shackles take the form of metal bars formed to create tapered slots for each leg. Hanging from these shackles compresses and strains the legs and joints. Sparrey (1995) reports that forces of five or ten times the birds' weight are frequently used to pull the birds into the tapering gap of the shackles resulting in severe compression of the bird legs by forces of around 180 N. Gentle and Tilston (2000), have shown that the legs of poultry are well supplied with nociceptors and so conclude this leg compression is likely to be painful. This pain may be worse for birds suffering from disease or abnormalities of leg bones or joints (Danbury et al., 2000). Male birds (which usually have thicker shanks) struggle sooner and longer than female birds, suggesting that the thicker the shank and the greater the compression, the more distress is experienced (Satterlee et al., 2000). Flapping and struggling is likely to cause further distress to birds, because of the potential for broken, bruised and dislocated wings (Jones et al., 1998), and because flapping increases the likelihood of pre-stun shocks caused by the birds' wings contacting the electrified water before the head enters the bath. Agitated birds can sometime flap their wings and avoid making any contact with the water-bath. They would therefore be bled while conscious. Low lighting and/or blue lighting in the shackling area can help to reduce struggling and wing flapping by birds directly after shackling (Prayitno et al., 1997; Jones et al., 1998) as can the presence of a curtain that the birds can lightly rest against, known as a breast comforting plate (Jones et al., 1998). The duration for which birds are on the shackle line should be controlled. If it is too long they suffer and it is too short they may still be struggling and flapping their wings as they approach the water-bath. It has been suggested that broilers should be allowed to settle on the shackles

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		for a minimum of 12 s, before entering the water-bath since research has shown that after this time the majority of birds have stopped flapping (Gregory and Bell, 1987). However, longer shackling durations are associated with increased corticosterone levels compared to shorter durations, particularly when shackling exceeds 60 s, indicating increased stress (Fidan et al., 2015). Some solutions to the problems caused by crushing in the shackles and inverting and suspending the birds have been proposed. These include a breast support conveyer and compliant shackles which conform to the size of a bird's legs (Lines et al., 2011; 2012). Neither development has been taken up commercially although the breast support conveyor has been built and used successfully in several small poultry processing lines. Industry experience suggests that it is particularly beneficial for turkeys.
GA10.4 When using gases to kill poultry a mixture of inert gases with a modified atmosphere containing at least 45% CO2 and up to 80% CO2 should be used.	When using gases to kill poultry a mixture of inert gases with a modified atmosphere containing at low levels of carbon dioxide (e.g. 30%) added to inert gas	This results in quicker unconsciousness and death than carbon dioxide alone but it is less aversive than high levels of carbon dioxide and it results in fewer convulsions than high levels of inert gas (Abeyesinghe et al., 2007; McKeegan et al., 2007a). Fewer convulsions decrease the chance for birds to break wings. Farmed Bird Welfare Science Review, October 2017. When using gas, birds to be exposed to low levels of carbon dioxide for a period of one minute before increasing the carbon dioxide concentrate to ensure the birds are killed. By doing so decreases the chance of convulsions including wing flapping resulting in broken bones may occur while they have some level of consciousness. Farmed Bird Welfare Science Review, October 2017.
Shackling GA11.5-11.6 Stunning – Electrical stunning systems GA11.9-11.11		Phase out electrical stunning and replace with gas stunning

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Laying chickens SB1.1-1.3		Remove. The community demands a ban on all caged egg production systems.
SB1.5 A person in charge must ensure that after the training period, where hens are housed under artificial light, lighting schedules must provide a minimum of 4 hours of continuous darkness in each 24-hour period.	A person in charge must ensure that after the training period, where hens are housed under artificial light, lighting schedules must provide a minimum of 8 hours of continuous darkness in each 24-hour period.	For their health and welfare, chickens must be allowed to sleep in darkness for at least 8 hours a day, and 'daylight' hours must be adequately bright to allow freedom of movement and healthy eye development. The Farm Bird Welfare Review provides evidence that broilers benefit from 8 hrs of continous darkness: “For Broilers”an appropriate photoperiod (e.g. 16 hours of light:8 hours of dark at 20 lux) from the second week, should encourage activity and benefit leg health.” (B10) and ”An 8 h scotoperiod generally appears to be associated with low fear levels. Fearfulness has generally been found to be higher under continuous or near-continuous light than under constant light (16L:8D) (Sanotra et al., 2002; Onbaşilar et al., 2008; Bayram and Özkan, 2010; Toplu et al., 2016)., Leg health, leg bone quality and FPD benefit from a longer scotophase (see B3.3g and B3.4a). Lewis and Gous (2009) report a negative linear relationship between eye weight and photoperiod (2-21 h light). Heavier eyes (macrophthalmia) are also reported in continuously illuminated birds (Lewis and Gous, 2009; Schwean-Lardner et al., 2013). These results indicate that normal ocular development in broilers requires a maximum photoperiod of 20 h and that short photoperiods, in addition to continuous illumination, may be harmful for eye health., Bayram and Özkan (2010) also observed that birds maintained under a 16L:8D photoperiod displayed greater sociality (as assessed by social reinstatement runway tests), compared to birds exposed to continuous lighting.” (B8.1). It is reasonable to infer that the same applies to layer hens and therefore must be provided with 8hrs of continuous dark daily.
SB1.6-1.7		Remove. The community demands a ban on all caged egg production systems.
SB1.8 A person in charge must not exceed a stocking density of 30 kg/m2 (measured as bird density in the useable area) for rearing laying pullets and for managing adult laying chickens.		Please refer to the stocking density for laying pullets and adult laying chickens as submitted by Animals Australia
GB1.1 The slope of the floor should not		Mesh and plastic slat flooring must not be used as the Review identifies

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exceed 8 degrees. Where mesh flooring is used, the mesh size should be less than 25 mm x 25 mm.		welfare issues with these flooring types. It is recommended that wooden floors be used instead. " Generally, the wire floors of cages are a risk factor for hyperkeratosis but exposure to dirty perches or litter increases the risk of bacterial infection. Heerkens et al. (2016b) found prevalences of 42% hyperkeratosis, 27.6% dermatitis and 1.2% bumblefoot in hens from 47 non-cage MT flocks. However, in a promising development, the provision of ramps between perches has been shown to have a strongly significant beneficial effect in reducing foot lesions in non-cage MT systems (Heerkens et al., 2016a)." And "Plastic flooring appears to have negative effects in comparison with wire mesh flooring, being associated with reduced plumage quality (Whay et al., 2007; Heerkens et al., 2015) and higher mortality and prevalence of wounds (Heerkens et al., 2015).(LH3.8)
GB1.2 The lighting system should provide a minimum period of 8 hours continuous artificial or natural lighting per day and a minimum period of 7 hours continuous darkness (with all lights off) to be provided at night, in every 24-hour period. The exception to this is during extreme heat where feeding birds during cooler parts of the day may be required to reduce the risk to their welfare.	The lighting system should provide a minimum period of 8 hours continuous artificial or natural lighting per day and a minimum period of 8 hours continuous darkness (with all lights off) to be provided at night, in every 24-hour period. The exception to this is during extreme heat where feeding birds during cooler parts of the day may be required to reduce the risk to their welfare.	
GB1.3 The light intensity measured at bird head height across the laying facility, during the light period, should be at least 10 Lux.		Please refer to optimum light intensity for layer chickens as recommended by Animals Australia and their recommendation must be incorporated into a Standard that replaces GB1.3.
GB1.5 When using litter, poultry should be given continuous access to litter as soon as possible but no later than 3 weeks following placement allowing for a period in which to train birds to use the nests.	Poultry should be given continuous access to litter immediately following placement.	It is essential that layer chickens are not deprived of enrichment and instead are allowed to access litter and forage in the period after they lay eggs. The Review states that" When new birds arrive in the house, practices such as confining birds to the slatted areas near the nest boxes, not allowing access to litter substrates, not allowing access to the outdoor range, placing electrified wires on parts of the litter floor where eggs might be laid can inadvertently increase the risk of injurious pecking. Modifying

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		these practices (e.g. to allow newly housed birds access to litter during afternoon periods when most egg laying has finished) can help solve both problems (Lambton et al., 2013).
GB1.7 Hens should be provided with a minimum of one single nest for every 7 birds or 1m² nesting box area for every 120 birds.		Please refer to the optimum number of layer chickens per nest box or optimum nesting box area for a specified number of layer chickens as recommended by Animals Australia and their recommendation must be incorporated into a Standard that replaces GB1.7.
GB1.8 Nest boxes should be enclosed and provide a suitable floor substrate to encourage nesting behaviour		The Review found that" The most important influence on nest selection, however, appears to be the provision of some form of nesting material (Freire et al., 1996; Struelens et al., 2008b). The sight alone of nesting material can trigger nesting behaviour in some birds (Hughes et al., 1995). Straw is preferred over peat or wood-shavings as a nesting material"(LH5.3)
GB1.12 Where electric wires are used along walls and corners to prevent floor eggs, these should: only be turned on in the morning during nest box training be turned off in the afternoon not be used once birds have learnt to lay in the nest.	Electric wires must not be used along walls and corners to prevent floor eggs.	The Review recommends alternatives to the use of electric wires to train birds to use nests for laying eggs. "When new birds arrive in the house, practices such as.... placing electrified wires on parts of the litter floor where eggs might be laid can inadvertently increase the risk of injurious pecking. Modifying these practices (e.g. to allow newly housed birds access to litter during afternoon periods when most egg laying has finished) can help solve both problems."(LH5.3)
GB1.17 Birds should be given access to the veranda as soon as possible but no later than 3 weeks following placement allowing for a period in which to train birds to use the nests.	Birds must be given meaningful daily access to the veranda without delay following placement.	The Review found that the management practice of keeping birds indoors without access to the veranda during the training period created the issue of injurious pecking. Modifying this management practices is recommended. "When new birds arrive in the house, practices such as confining birds to the slatted areas near the nest boxes, not allowing access to litter substrates, not allowing access to the outdoor range, placing electrified wires on parts of the litter floor where eggs might be laid can inadvertently increase the risk of injurious pecking. Modifying these practices (e.g. to allow newly housed birds access to litter during afternoon periods when most egg laying has finished) can help solve both problems (Lambton et al., 2013)."(LH5.3)
GB1.19 The usable floor area of the veranda should provide sufficient space to allow at least one third of the flock to forage		Incorporate the recommendation of Animals Australia as to the optimum space allocation in the veranda to meet the foraging and dust bathing needs of the flock.

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and dust-bathe at any one time.		
GB1.23 At least 8 m² of natural and/or artificial overhead shade/shelter per 1000 birds should be provided and distributed across the outdoor area.		Upgrade to Standard and incorporate the recommendation of Animals Australia for minimum area of shade/shelter per 1000 birds in the outdoor area
GB1.27-1.31		Remove as the community demands an immediate ban on all caged egg production systems.
SB2.1 A person in charge must ensure that after 7 days of age, lighting patterns must encourage activity and provide a minimum period of 4 hours of continuous darkness each day except on the day of pickup (meat chickens) and meat chickens during very hot weather.		This must be changed to a minimum of 8hrs dark for all broiler chickens including chicks. The Review clearly found that: -"Commercial broiler production is not generally designed to accommodate sleep and rest. The initial provision of continuous or near continuous bright light to chicks following placement within barns encourages high activity. Chicks attempting to sleep or rest are likely to encounter continual disturbance as large numbers of flock-mates move between the drinkers and feeders. birds reared under constant, or near-constant, light are at a higher risk of suffering from sleep fragmentation (i.e. are sleep-deprived). The provision of a distinct photoperiod could improve broiler welfare by promoting pronounced behavioural rhythms within a flock, and allowing them a distinct period of rest during the scotophase, as well as reducing disturbance from flock-mates during this period of rest (Alvino et al., 2009b)."(B8.1a) -" Continuous or near-continuous daylength has a negative impact on many aspects of broiler health. H:L ratios are generally higher under continuous or near continuous light (24L:0D or 23L:1D) than under constant light (16L:8D: Onbaşilar et al., 2008; Coban et al., 2014; Das and Lacin, 2014; Toplu et al., 2016)." -" Exposure to chronic stress is often seen to suppress immunity. Intermittent lighting (1L:3D), but not constant lighting (16L:8D), was seen to improve immune function compared to continuous lighting (24L:0D); spleen weight remained unaffected by lighting regime (Onbaşilar et al., 2007; 2008)." Activity (including the percentage of time spent standing, walking, feeding, drinking, preening, stretching, dust-bathing and litter pecking) decreases with increasing day-length (Sanotra et al., 2002;

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		Bayram and Özkan, 2010; Schwean-Lardner et al., 2012) regardless of age or stocking density. Schwean-Lardner et al. (2012) observed no behavioural advantage associated with the longest scotoperiod they tested (14L:10D), so they recommend a photoperiod of 16L:8D as optimum. Bayram and Özkan (2010) also observed that birds maintained under a 16L:8D photoperiod displayed greater sociality (as assessed by social reinstatement runway tests), compared to birds exposed to continuous lighting. Interestingly, dust-bathing was not observed in older broilers reared under 23L:1D (Schwean-Lardner et al., 2012). The reduction (or elimination) of locomotive, exploratory, social, comfort and nutritive behaviours, including those that are highly motivated, are likely to indicate reduced welfare in birds raised under constant, or near-constant, light."(B8.1a) -"an appropriate photoperiod (e.g. 16 hours of light:8 hours of dark at 20 lux) from the second week, should encourage activity and benefit leg health." (B10) and "An 8 h scotoperiod generally appears to be associated with low fear levels. Fearfulness has generally been found to be higher under continuous or near-continuous light than under constant light (16L:8D) (Sanotra et al., 2002; Onbaşilar et al., 2008; Bayram and Özkan, 2010; Toplu et al., 2016)., Leg health, leg bone quality and FPD benefit from a longer scotophase (see B3.3g and B3.4a). Lewis and Gous (2009) report a negative linear relationship between eye weight and photoperiod (2-21 h light). Heavier eyes (macrophthalmia) are also reported in continuously illuminated birds (Lewis and Gous, 2009; Schwean-Lardner et al., 2013). These results indicate that normal ocular development in broilers requires a maximum photoperiod of 20 h and that short photoperiods, in addition to continuous illumination, may be harmful for eye health., Bayram and Özkan (2010) also observed that birds maintained under a 16L:8D photoperiod displayed greater sociality (as assessed by social reinstatement runway tests), compared to birds exposed to continuous lighting." (B8.1)"
SB2.3 A person in charge must not exceed the following stocking densities for meat chickens…		Amend SB2.3 to incorporate the recommendations of Animals Australia for the maximum stocking densities for meat chickens based on specific housing and ventilation systems.
GB2.2 Where slatted or perforated plastic flooring is used, the smaller of the dimensions of the gaps or perforations		Remove GB2.2 as the Review notes that unlike broilers, broiler breeders are routinely raised on plastic slats, and that the material may partially explain the high incidence of Foot Pad Dermatitis in broiler breeders.

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should be no greater than 25 mm.		"Kaukonen et al. (2016) observed foot pad condition to deteriorate towards slaughter age in breeder hens, at which point the majority (64%) of birds had severe FPD lesions (scored 4 on a 5-point severity scale). FPD score was positively associated with litter moisture, pH, and percentage slatted area; interestingly, litter condition in breeder houses did not appear to fully explain foot pad deterioration, since the maintenance of dry, friable litter over the whole production period did not guarantee foot health (Kaukonen et al., 2016). Unlike broilers, the feet of breeders make contact with plastic slats in addition to litter, and the elevated slats are often used for roosting; bird mass, time spent on the slatted areas, and slat design may all be important factors in determining FPD prevalence and severity in broiler breeders."(BB3.8a)
SB3.1-3.3		Remove as the community demands an immediate ban on all caged production systems.
SB3.5 A person in charge must ensure that after the training period, where hens are housed under artificial light, lighting schedules must provide a minimum of 4 hours of continuous darkness in each 24-hour period.	A person in charge must ensure that after the training period, where hens are housed under artificial light, lighting schedules must provide a minimum of 8 hours of continuous darkness in each 24-hour period.	The Review clearly states" A photoperiod of 16L:8D.....appears to be appropriate during the production period (lay). Lighting programmes for breeders are very similar to those recommended for laying hens, yet very different from those recommended for broilers. These usually comprise an 8 hour photoperiod during rear, then a transfer to a mildly stimulatory day length of 11-12 h at approximately 20 weeks, followed by a series of weekly increases in day-length to reach 15-16 h by 28 weeks (AHAW, 2010). Lewis (2006) suggests that 12 h days during production are perfectly adequate for optimising egg production and shell quality."(BB7.1)
SB3.6 A person in charge must ensure meat and laying chicken breeders are not lifted or carried by the head, neck, wings, feathers or tail feathers unless otherwise supported by the breast, except if lifted and carried by the base of both wings.	SB3.6 A person in charge must ensure meat and laying chicken breeders are not lifted or carried by the head, neck, wings, feathers or tail feathers unless otherwise supported by the breast	
SB3.10 A person in charge must not exceed a stocking density of 30 kg/m2 (measured as bird density in the useable area) for pullets and adult birds (including roosters)		Amend Standard to incorporate the recommendation by Animals Australia for the minimum stocking density (measured as bird density in the useable area) for pullets and adult birds (including roosters) in non-cage breeder hen systems.

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GB3.1 Hens should be provided with a minimum of one single nest for every 7 birds or 1m² nest boxes for every 120 birds		Upgrade to Standard and incorporate the recommendations by Animals Australia for the minimum number of nest boxes available for a flock of breeder hens.
GB3.2 Where slatted or perforated plastic flooring is used, the smaller of the dimensions of the gaps or perforations should be no greater than 25 mm.		Remove GB3.2 as the Review notes that broiler breeders are routinely raised on plastic slats, and that the material may partially explain the high incidence of Foot Pad Dermatitis in broiler breeders. “Kaukonen et al. (2016) observed foot pad condition to deteriorate towards slaughter age in breeder hens, at which point the majority (64%) of birds had severe FPD lesions (scored 4 on a 5-point severity scale). FPD score was positively associated with litter moisture, pH, and percentage slatted area; interestingly, litter condition in breeder houses did not appear to fully explain foot pad deterioration, since the maintenance of dry, friable litter over the whole production period did not guarantee foot health (Kaukonen et al., 2016). Unlike broilers, the feet of breeders make contact with plastic slats in addition to litter, and the elevated slats are often used for roosting; bird mass, time spent on the slatted areas, and slat design may all be important factors in determining FPD prevalence and severity in broiler breeders.”(BB3.8a)