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Report on the welfare impact of Better Chicken Commitment on UK Broiler production.

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Executive Summary:

European Directives, national UK legislation and de facto mandatory consumer or retailer led standards operate synergistically to safeguard chicken welfare in the UK. The detailed requirements stipulated by these various instruments offer clear production standards with regards to stocking density, provision of light, use of enrichment and a program of independent audit to assure compliance.

In the UK, translation of these standards means that lower (33 Kg/m²) or higher (38 Kg/m²) stocking density may be permitted depending on whether the farm in question can demonstrate an ability to maintain bird welfare at higher stocking densities. Farms wishing to stock at this higher density must be registered with APHA. Stockmen operating these farms must be sufficiently experienced or hold qualifications relevant to poultry production, and the poultry units must be capable of maintaining a comfortable environment for the chickens and dry litter conditions even in the face of extreme weather conditions. Key welfare indicators at slaughter are used to assess and monitor the outcome of farming under these enhanced conditions at higher stocking density.

This approach to safeguarding the welfare of meat chickens is well supported by peer reviewed scientific literature which finds that good husbandry and factors such as capacity to ventilate sufficiently and maintain dry and friable litter conditions have a more dramatic impact on welfare outcomes than simply limiting stocking density. The existing framework which governs poultry production allows for continuous assessment of welfare outcomes, with independent external audit, and requires that farms are well managed and able to maintain optimum environmental conditions at stocking densities of up to 38 Kg/m². Welfare outcome data captured following implementation of the European Broiler Directive demonstrates the ability to enable high welfare, economical and sustainable chicken production whilst stocking at up to 38 Kg/m².

The Better Chicken Commitment (BCC) presents a number of suggested requirements for chicken farming which the group of authors consider would mitigate concerns around bird welfare. Unfortunately the lack of detail in the written requirements makes detailed assessment of the requirements difficult. However, the assessment of the literature around stocking density does not suggest that reducing stocking density from 38 Kg/m² to the suggested 30 Kg/m² in itself would have significant effects on welfare outcomes, especially where UK legislation ensures that birds at higher stocking levels are supported with improved stockmanship and enhanced environmental control.

A number of the BCC requirements are aligned with existing Red Tractor standards. However, in addition to the requirement for lowered stocking density, the requirement to use slow growing broiler breeds will have a significant impact on the cost and

sustainability of production (see report by ADAS). Using the criteria suggested by BCC, welfare assessments conducted on these slow growing breeds is conducted at extremely low stocking densities in small pens, using bespoke diets and therefore do not reflect normal commercial growing conditions. For these reasons it is difficult to conclude that the use of such breeds offer a significant advantage over faster growing breeds under commercial conditions. Similarly, literary review has not established evidence of a welfare benefit of increasing light intensity to a measured minimum of 50 lux as outlined in the broad BCC requirement of “At least 50 lux of light”.

Following assessment of the BCC standards and literary review of the impact of requirements raised by the BCC it is considered that the existing assurance scheme provided by Red Tractor, Assured Chicken Production, offers the consumer an independently audited production standard which operates within a regulatory framework which monitors welfare outcomes and leverages the importance of stockmanship and environmental management in order to produce sustainable, affordable, high welfare chicken.

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Stephen Lister qualified from Royal Veterinary College, London in 1979, and has been involved in the poultry industry for the past 40 years. Since 1995 he has been a partner in Crowshall Veterinary Services, a dedicated veterinary practice offering veterinary services in poultry disease diagnosis and consultancy with full post-mortem and UKAS ISO17025 accredited laboratory facilities.

He is a Foundation Diplomat and Vice President of the European College of Poultry Veterinary Science (ECPVS). He is a EBVS European Specialist in Poultry Veterinary Science and Royal College of Veterinary Surgeons Recognised Specialist in Poultry Medicine and Production

Over the last 30 years he has served on a number of advisory committees on animal welfare as a trustee of the British Veterinary Association Animal Welfare Foundation, Member of Farm Animal Welfare Council (FAWC) and Chairman of Pigs, Poultry & Fish Standing Committee of FAWC. He served as Chairman of the Defra Beak Trimming Steering Group and remains a Member of the Laying Hen Welfare Forum.

He is a Member and Past President of the British Veterinary Poultry Association (BVPA), Past President of EU Poultry Veterinary Study Group (EUPVSG), and Past President of the Turkey Club UK.

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Ian Lowery qualified from the Royal Veterinary College in 2006 and joined Crowshall Veterinary Services in 2009, becoming a partner in 2014.

Ian has gained a post graduate certificate in Intensive Livestock Health and Production subsequently becoming recognised by the RCVS as an Advanced Practitioner in Poultry Health and Production.

Ian has a particular interest in the quality of the data which can be used to drive enhanced health and welfare in the poultry industry. He is currently working towards a professional doctorate which considers the economic impact of effective management of

poultry drinking water. He has a broad experience in health and welfare of all poultry species, with special interest in free range broiler and commercial egg laying production.

Background:

The “Better Chicken Commitment”, also known as the “European Chicken Commitment” outlines requirements for a “baseline” for broiler production. These requirements are authored by a group of organisations who consider that, if implemented, the requirements would mitigate concerns relating to welfare aspects of current broiler production. Businesses operating through the chicken supply chain are being encouraged to sign up to the requirements. This report reviews the broad requirements of the Commitment and compares them to current UK broiler production standards.

Introduction:

UK Red Tractor Food Assurance Schemes stipulate production standards which assure food safety, animal welfare, hygiene and environmental protection through the food chain. Red Tractor Assured Chicken Production (ACP) standards exceed minimum regulatory standards laid down by the EU and incorporate the recommendations of the EU Scientific Committee on Animal Health and Animal Welfare 2000 report on “The welfare of chickens kept for meat production (Broilers)”. These standards have been widely adopted by retailers as they offer consumers a high quality product, guarantees around provenance, and high welfare credentials at an affordable price point. Approximately 90% of the UK’s broilers are grown to ACP standards which are held in high esteem by retailers and consumers.

ACP standards stipulate a number of management conditions to safeguard welfare including maximum stocking density (38 Kg/m² vs up to 42 Kg/m² in other EU Member States), enrichment (perches and pecking objects), and provision of natural light and lighting conditions (minimum of 20 lux over 80% of the useable floor area with a minimum dark period of 6 hours of which 4 must be uninterrupted).

A number of other assurance schemes, for example RSPCA Assured, RSPCA Assured Free Range and Organic, provide standards for niche chicken production. These standards generally stipulate lower stocking densities, longer growing periods, use of approved breeds, and access to outdoor areas. These requirements significantly increase the cost of production and as a result the chicken meat demands a high retail price and much smaller market share when compared to Red Tractor indoor reared chicken. Industry estimates suggest current weekly slaughter of about 750,000 free range broilers, representing only 4% of UK production of 20 million broilers per week.

The “Better Chicken Commitment”/“European Chicken Commitment” is a set of six broad requirements developed collaboratively by a number of European organisations active in promoting animal welfare. A number of these requirements are aligned with current ACP standards. The requirements are presented as a common agreement which the authors assert address the most “pressing welfare concerns related to broiler production” and which it is suggested could “mitigate these concerns”. In recent months the organisations involved in developing the Better Chicken Commitment (BCC) have been lobbying consumers, retailers and other food service businesses to commit to purchase chicken which fulfils their six requirements by 2026. The BCC standards are designed to be applied to broiler production across Europe and to this end it is notable that in many areas higher welfare UK ACP chicken production already fulfils the requirements of BCC. However, in certain areas BCC production standards deviate

from the standards stipulated by ACP. BCC and ACP requirements are compared in Figure 1. Where differences are identified the blue text outlines where further assessment of the scientific literature must be conducted as part of this review paper.

Figure 1: BCC requirements with comparison to ACP production and comment where standards differ.

6 Requirements of the BCC	Comments
1. Comply with all EU animal welfare laws and regulations, regardless of the country of production.	All UK production comply with EU welfare laws. ACP standards exceed these minimum requirements. It is assumed that UK welfare laws will continue to meet or exceed those of the EU in the event of the UK leaving the EU.
2. Implement a maximum stocking density of 30 Kg/m ² or less. Thinning is discouraged and if practiced must be limited to one thin per flock.	ACP maximum stocking density is set at 38 Kg/m ² . Review of scientific literature assessing effect of stocking density on chicken welfare required.
3. Adopt breeds that demonstrate higher welfare outcomes: either the following breeds, Hubbard JA757, 787, 957, or 987, Rambler Ranger, Ranger Classic, and Ranger Gold, or others that meet the criteria of the RSPCA Broiler Breed Welfare Assessment Protocol.	ACP does not stipulate a breed or maximum growth rate (which the RSPCA criteria caps at 60g/day). Assessment of RSPCA Broiler Breed Welfare Protocol and review of scientific literature assessing effect of RSPCA criteria on welfare required.
4. Meet improved environmental standards including: <ul style="list-style-type: none"> • At least 50 lux of light, including natural light. • At least two metres of usable perch space, and two pecking substrates, per 1,000 birds. • On air quality, the maximum requirements of Annex 2.3 of the EU broiler directive, regardless of stocking density. • No cages or multi-tier systems. 	ACP standard are consistent with all of these improved environmental standards with the exception of the requirement for 50 lux of light. This requirement lacks detail and requires further consideration in light of practical experience and scientific literature review.
5. Adopt controlled atmospheric stunning using inert gas or multi-phase systems, or effective electrical stunning without live inversion.	This requirement lacks detail, appears to omit the use of low atmospheric pressure stunning and may prevent adoption of the BCC where retailers have a commitment to supply chicken to Halal markets.
6. Demonstrate compliance with the above standards via third-party auditing and annual public reporting on progress towards this commitment.	ACP standards require audit by ISO accredited auditors to ensure ACP standards are maintained.

This paper will consider the requirements of the BCC which deviate from ACP standards with a view to examining any additional welfare benefits which might be realised by producing chicken according to BCC standards through review of published scientific literature.

BCC requirement 1 requires these standards to be applied to all production “regardless of country of production” indicating that retailers would be expected to extend these requirements to ALL chicken and chicken products placed on sale in the UK, including all imported poultry meat.

BCC requirements 2 and 3 require production methods which diverge significantly from existing ACP standards and which are likely to add significantly to the cost of production. Investigation by ADAS into the economic impact of BCC production indicates that BCC production will increase the cost of production by 18%. Less efficient use of growing space and higher leg meat to breast meat ratio from slower growing breeds also bring into question the environmental sustainability of the BCC standards. The effects of BCC

requirements on chicken welfare will be considered in more detail in parts 2, 3 and 4 of this review document.

Part 2: Effect of Reducing Stocking Density from 38 Kg/m² to 30 Kg/m² on Broiler Welfare

The BCC document is brief and lacks detail around their requirements. With regards to requirement 2, it is not explained how a maximum stocking density limit of 30 Kg/m² has been arrived at. It is also unclear which aspects of welfare related to broiler production are to be addressed through this reduction in stocking density.

Studies into the effect of stocking density on broiler welfare have studied chickens over a very wide range of stocking densities, from 10 Kg/m² to 50 Kg/m² in deep litter systems and up to 80 Kg/m² in cage systems. Experiments have shown that extremes of high density stocking can be associated with poor welfare. However, the effects of stocking density do not change linearly, and are not consistent over a variety of welfare indicators (including behavioural and physiological indicators of stress, leg health, footpad health, growth rate, bird activity and mortality). It is logically flawed to assume, without experimentally testing the hypothesis, that reducing the stocking density from 38 Kg/m² to 30 Kg/m² will automatically realise significant or tangible welfare benefits, especially when overall welfare is measured across a number of indicators or outcomes.

Broadly speaking the literature demonstrates that significant reductions in stocking density are associated with:

- Increased feed intake and increased growth rate
- Reduced foot pad lesions, breast blisters and soiled plumage (although these are thought to be more directly due to effects on litter quality which can generally be largely controlled.)
- Improvement in gait score

Studies have shown much more variable correlation between stocking density and effects on FCR (studies show improvements and deterioration with decreasing stocking density), scratching damage (generally increased stocking seems to be correlated with increased scratching damage), mortality (most studies show no correlation between stocking and mortality), physiological stress (most studies show no correlation between stocking and stress) and behaviour (observed behaviours tend to reduce with age and are thus little affected by stocking as maximum stocking densities are not achieved until maximum bird weight is reached).

More detailed analysis of these studies demonstrates that reduced feed intake and increased foot pad lesions are both related to increasing pressure on the litter as stocking density increases. Litter temperatures increase with increasing stocking densities (studies have demonstrated this between 19 and 40 Kg/m²) as a result of increased bacterial activity. This can lead to heat stress, reduced feed intake and reduced growth rates. Similarly in highly stocked houses increased humidity and ammonia in the litter contribute to foot pad lesions and breast blisters. Crucially however, investigation of houses with lower stocking densities (10 to 35 Kg/m²) demonstrated that litter moisture and ammonia levels are the primary driver of these negative welfare outcomes rather than stocking density. Appropriate stockmanship and investment in suitable equipment to manage litter conditions are therefore considered by

this paper to be more important in safeguarding welfare than arbitrary limits on stocking density.

Meta-analysis of the studies which assess impact of stocking density on flock performance suggest that good husbandry, leading to control of litter temperature, moisture and ammonia levels can negate any impact stocking density may have on foot pad health or breast blistering. Indeed, these studies demonstrate no clear, critical stocking density from which point welfare is decreased. It is notable that technological developments in poultry housing, ventilation and drinker systems have led to far greater control over the micro-litter environment. Furthermore BCC requirement 1 demands compliance with “EU animal welfare laws”, specifically in this case Directive 2007/47/EC which stipulates that where chickens are stocked in excess of 33 Kg/m² ventilation equipment is sufficient to maintain good environmental conditions (see figure 2). This same legislation also requires that keepers receive recognised training.

Figure 2: Except from Directive 2007/47/EC:

The owner or keeper shall ensure that each house of a holding is equipped with ventilation and, if necessary, heating and cooling systems designed, constructed and operated in such a way that:

- (a) the concentration of ammonia (NH₃) does not exceed 20 ppm and the concentration of carbon dioxide (CO₂) does not exceed 3 000 ppm measured at the level of the chickens' heads;
- (b) the inside temperature, when the outside temperature measured in the shade exceeds 30 °C, does not exceed this outside temperature by more than 3 °C;
- (c) the average relative humidity measured inside the house during 48 hours does not exceed 70 % when the outside temperature is below 10 °C.

Government approved welfare training has ensured that keepers are aware of the importance of maintaining a good environment in the poultry house. It is vital to recognise that existing UK production standards therefore, already demand a level of stockmanship and environmental management which ought to offer better welfare returns than simple manipulation of stocking density within the limits being considered (from 38 Kg/m² to 30 Kg/m²). Farm Animal Welfare Council has always maintained that stockmanship is the single most important influence on the welfare of farm animals and outlined the importance of training requirements in their 2007 report on stockmanship and farm animal welfare.

The Poultry Passport scheme sets a common standard of training requirements adopted by ACP standards. It defines the training that an individual requires and the topics to be covered within each training module. Stockmen are expected to complete the initial training, alongside regular refresher training, in order to comply with the Red Tractor standards. The course is accredited as a City & Guilds Diploma in work based agriculture and teaches topics appropriate to the individuals, farm and role. Individuals are also assessed for competence against National Occupational Standards in order to achieve their qualification. Regular refresher training, in the form of classroom-based courses ensure that the individuals are kept up to date with changes in legislative requirements and best practice. Each individual's training record is contained in a training passport.

Appropriate high light intensity (see part 4) in conjunction with a lighting pattern with appropriate photoperiod, will also reduce the time broilers spend sitting on the litter and will thus aid in the management of the litter micro-environment further mitigating published effects of increasing stocking density.

The scientific literature is in general agreement that good stockmanship in conjunction with good environmental management; including inputs to ensure control of house temperature and humidity, and litter moisture, contribute significantly to improvements in broiler welfare outcome measures particularly those relating to foot pad dermatitis and hock burn. When integrated welfare scores are used to measure bird welfare at different stocking densities the best welfare scores were found below 15 Kg/m² and the worst welfare scores were found at 56 Kg/m². However, different studies have shown that birds stocked at 23, 33, 35, and 47 Kg/m² demonstrate no consistent or significant difference in integrated welfare scores. This review reflects the overall finding in the literature that few welfare indicators are specifically or consistently associated with stocking density rates, at least up to the standard maximum of 38 Kg/m² offered under the Red Tractor assurance scheme. These specific aspects of bird welfare can be improved by other means and ought to be subjected to more targeted interventions and monitoring of welfare indicators.

The body of scientific literature reviewed by this paper considering the effect of stocking density on broiler health and welfare are well summarised by the following two quotes from two significant research papers on the subject:

"Legislation to limit stocking density that does not consider the environment that the birds experience could thus have major repercussions for European poultry producers without the hoped-for improvements in animal welfare." (Dawkins 2004)

"Therefore, perhaps a more realistic way of addressing the upper limit to density for broilers should be to insure that proper environmental conditions are met for a (reasonable) range of densities. This can be achieved, for example, by limiting maximum relative humidity, litter moisture, ammonia, and temperature ranges for the different rearing phases. This approach has the advantage of not imposing a unique limit of density per se to producers, but affords them the ability to raise a larger number of broilers (within a reasonable range of densities) as long as they are able to maintain the right environmental quality to preserve and ensure the health and welfare of the thousands of birds raised in their facilities" (Estevez 2007)

Part 3: Adoption of breeds that “demonstrate higher welfare outcomes”

Requirement 3 requires that producers adopt “breeds that demonstrate higher welfare outcomes”. Those listed are currently approved by the RSPCA, although the requirement allows for inclusion of any breed which meets the criteria of the RSPCA Broiler Breed Welfare Assessment Protocol.

The RSPCA Broiler Breed Welfare Assessment Protocol compares the slow growing Hubbard JA57 breed to other broiler breeds, many of which are not currently available in the UK, under controlled environmental and nutritional conditions. Assessment of a number of parameters, including walking ability, feather cover, plumage dirtiness, leg straightness, pododermatitis and hock burn are made at 2.2 Kg liveweight. Assessment is made under very low stocking conditions (18.7 Kg/m²) in small trial pens containing just 50 birds. This does not reflect current broiler production practices. Low stocking density in very small pens may lead to high daily growth rates in broiler breeds resulting in growth rates which could potentially impact on leg health and footpad integrity. It does not follow that breeds which gain approval under these very low stocking densities

and with provision of very specific diets will be the same breeds which are well adapted to commercially tailored diets and stocking at either 30 Kg/m² or 38 Kg/m².

The Broiler Breed Welfare Assessment Protocol appears to take a quasi-scientific approach to the testing of breeds. Breeds are compared to a “Control breed” and also against set threshold values (particular attention is paid to a threshold on daily growth rate). Overall assessment is made through statistical assessment of mean scores relating to a number of parameters including walking ability, feather cover, breast plumage dirtiness, leg straightness, pododermatitis, hock burn, mortality and culling. It is notable that no direct behavioural or physiological measures of welfare are made, nor are positive welfare indicators measured and assessed. Furthermore the decision to use the Hubbard JA57 as a control breed is not justified or defended.

The published scoring guide for pododermatitis and hockburn (Appendix 1 of RSPCA Broiler Breeds Welfare Assessment Protocol) references Marian Dawkins 2004 paper in Nature (“Chicken welfare is influenced more by housing conditions than by stocking density”). However the scoring of pododermatitis and hockburn published in the Nature paper which is referenced followed a simple 0, 1 or 2 scoring system. A similar scoring system is used by FSA when scoring broiler footpad health at slaughter. The scoring system published by the RSPCA is more complicated offering scores of 0, 0P, 0S, 0H, 0.5, 1.0, 1.5, 2.0. Broadly speaking the integer scores of 0, 1 and 2 are largely comparable to Dawkins scoring however the inclusion of intermediate scores makes direct comparison with published broiler slaughter data difficult.

The assessment requires that both the test and control breed are assessed for defined negative welfare measures. Average scores are compared and statistical analysis (type of statistical test not given) conducted to determine whether any differences between the means are statistically significant. Given the range of comparisons made during the assessment it seems unlikely that the test breed will demonstrate equal or lower scores across all measures and therefore some subjective assessment of the breed must be conducted to determine whether test breeds are to be accepted for use within the RSPCA Assured scheme.

Where absolute thresholds are given (eg 60g per day mean weight gain), there is no explanation as to how this threshold has been determined. However, many of the thresholds are closely aligned with current ACP production practices. Some of the permitted breeds demonstrate much slower growth rates than the published threshold (eg Rambler Ranger) and are likely to have performed very favourably in the assessment trial. However, these “better” breeds have not become the recognised control breed. Therefore, in development of this assessment protocol certain welfare thresholds have been established which the RSPCA consider to be absolute thresholds to safeguard welfare. However, there is no scientific literature to support this position, and the use of the Hubbard JA57 as a control breed seems somewhat subjective.

Defra commissioned review of the very large FSA post mortem condition dataset from the UK (representing 2.7 billion birds), collected between 2010 and 2014 allows some comparison between standard broiler welfare measures and those thresholds set by the RSPCA (see Figure 3).

Figure 3:

Welfare Parameter	RSPCA Threshold	Average actual Broiler data	Comments
House Mortality	3%	2.23%	The RSPCA threshold does not include mortality in the first week. The FSA data is total mortality per house
Footpad dermatitis	90% score <1	85% score <1	FSA do not score loads where footpad health appears acceptable, The 85% score <1 figure comes from published literature
Mean daily growth rate	60g per day calculated by determining age at 2.2kg	61g under normal commercial broiler conditions.	Ross Broiler standard shows 2.2kg achieved at 35.5 days. 61g per day mean weight gain assuming chick weight of 40g.

Routine recording of foodpad health scores is only conducted where the Official Veterinarian has identified that a load of birds may have compromised footpad health. FSA data shows that only 2.4% of loads were subjected to footpad scoring at processing and thus the data presented represents the worst 2.4% of loads being processed. Average footpad dermatitis scores of 89 were recorded across these loads. Assuming that the integer scores of the RSPCA Assured and FSA systems are largely analogous, a score of 89 would indicate that between 11% and 55% of these birds had a foodpad dermatitis score <1.

The remaining 97.6% of loads for which no foodpad scoring was conducted must be assumed to have significantly healthier foodpad scores and therefore it is considered that the published study suggesting that 15% of broilers have footpad dermatitis (eg 85% have score <1) is a fair representation. It is important to note that these studies show indoor Freedom Food broilers had lower levels of pododermatitis whilst Free Range and Organic broilers had much **higher** levels of pododermatitis (over 98% of Organic birds were shown to have footpad lesions).

Assessment of walking ability, feather dirtiness, leg straightness and feather score is not routinely captured as part of FSA's work in line with fulfilling the requirements of the Broiler Directive. However, it is of note that feather pecking and feather loss are not conditions which are usually associated with indoor broiler production under normal commercial conditions, stocked at 38 Kg/m² and lit at 20 lux light intensity. This is largely due to the fact that development of pecking type behaviour generally increases with bird age, although factors associated with access to outdoor environments and brighter light may also predispose to injurious pecking behaviour. It follows therefore, that feather pecking is observed more commonly in older, slower growing, birds kept in lower stocked environments where access to the outdoors is commonly available. Such systems tend to have areas with high light intensity and also areas with lower light intensity. Light intensity also varies significantly over time according to weather conditions, time of year (affecting daylength) and whether windows or pop-holes are present.

Comparison of FSA slaughter data, published scientific literature and breed standards against the RSPCA welfare thresholds demonstrates that in a number of areas, including mortality and daily weight gain, birds grown to ACP standards already perform below the RSPCA set thresholds. In other areas, for example feather cover, as reported above there is little data available for standard broiler production as this behavioural condition is more commonly associated with longer lived birds in more extensive housing. There is some evidence that pododermatitis is improved in housed birds at lower stocking densities, although this benefit tends to be lost where birds are given

access to outdoor ranges (ie under Free Range or Organic conditions). The BCC requirements do not specifically state whether birds reared according to their requirements are only to be kept in housed conditions, although the “Chick-O-Meter” on the BCC website assesses a number of production systems and assurance schemes against five criteria, one of which is “Live outdoors half of their lives”. This suggests that access to outdoors is considered a positive attribute by BCC.

Given the significantly different level of pododermatitis experienced between housed birds and those with outdoor access it is appropriate that the RSPCA conducts testing at low stocking densities to better reflect growing conditions as the majority of birds reared under RSPCA Assured will fall into Free Range or Organic categories. However, where production requirements are tailored towards indoor production, it would be more rational to assess candidate breeds under conditions more aligned with ACP standards. Review of the data and scientific literature would suggest that small changes to farming practice could achieve welfare outcomes which fall in line with the RSPCA’s stated thresholds.

Part 4: Light intensity and enrichments

Light intensity has been studied for different classes of poultry types for many years. Various trials have investigated the effects of lux levels on broilers varying from 1 to 200 lux, sometimes with multiple intermediate stages, but most frequently just comparing two levels. Far less studies have looked at light quality or spectrum used to achieve the measured lux level. This may be significant as lux is adjusted to human rather than avian spectral sensitivity and previously led to the recommendation that to truly assess chicken interpretation or perception of light intensity clux (chicken lux) based on the different light spectrum truly perceived by birds as bright “light” should be used. There is a potential adverse impact on welfare when light intensity is increased to high levels when measured only by lux. Whilst it is considered that modern fluorescent and LED lighting is probably perceived as brighter by birds than a simple lux meter measures there is a paucity of studies in this area. It is also, perhaps understandably, assumed that “natural” daylight would give the broad spectrum of light best recognised by birds, but again assurance schemes and legislation base this on measured lux as the inference on intensity perception. Many studies have also tried to incorporate lighting patterns and daylength in welfare or bird activity assessments which has further complicated the picture. Such studies have demonstrated that photoperiod is equally as important as intensity in stimulating bird activity. Activity per se as the desired welcome outcome of increased light has been associated with improved leg health but has also been linked to increased skin scratching with adverse effects on bird health and welfare and rejects at processing.

Meta-analysis of the literature on light provision is therefore difficult for the reasons outlined above. Light intensity less than 5 lux has been associated with low bird activity although there is some evidence that access to such dimly lit areas of the bird’s environment reduces fear responses. There is also support for differing intensity at different stages of rearing with birds showing preference for levels as high as 200 lux in the first 2 weeks of growth but favouring a much dimmer environment (down to 6 lux) at six weeks of age.

This review concludes from assessment of the literature that a minimum of 20 lux at bird level for 80% of the useable bird area, especially when coupled with a 24 rhythm including periods of at least 6 hours darkness is not associated with adverse welfare

impacts. In addition due to dependence on human lux it is likely that chickens perceive 20 lux as a “brighter” lux than our own interpretation. The provision of natural light through windows in broiler houses is now a commonplace requirement of most retailer requirements for UK broiler production and is a requirement within the current Red Tractor assurance scheme. In such houses for significant times of the day and year the lux level in broiler houses will consistently and significantly exceed 20 lux, whilst offering birds an environment with varying light intensities at bird level allowing birds to show their own individual preferences. Our literary review has not established an indication of a welfare benefit of increasing this intensity to a measured minimum of 50 lux as outlined in the broad BCC requirement of “At least 50 lux of light”.

In relation to perching space and provision of pecking substrates, and the EU requirements on air quality outlined in Directive 2007/47/EC Annex 2.3 these are already incorporated in the UK Red Tractor farm assurance standard.

In relation to the use of cages or multitier systems, the use of cages are specifically not allowed under UK Red Tractor standards and we are not aware of any UK multitier systems for broilers.

Part 5: Slaughter procedures

The majority of UK broiler slaughter plants use controlled atmosphere stunning using inert or multi-phase gas systems as required by BCC. This has obviated the welfare issues associated with prolonged live inversion of broilers. There is no reference in the BCC requirements to low atmospheric pressure stunning (LAPS) which has been recently approved within the EU with perceived welfare benefits at slaughter in avoiding any aversive effects of gas mixtures. It would be expected that any standard looking to demonstrate improvements in welfare would look to embrace LAPS at the point of slaughter.

The requirement also does not address the retailers commitment to supplying chicken and chicken products to the Halal market, currently estimated as about 3 million broilers per week slaughtered across some 23 slaughter plants.

Part 6: Compliance with third part auditing

All Red Tractor assessors are ISO accredited auditors. All certification body auditors are independent, ensuring that all current Red Tractor production is subject to accredited third part auditing.

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