

Summary of expert panel rationale for policy scenario scores

Policy case study: Stocking density in broiler production (39kg/m² max to 30kg/m² max)

Aggregate scores: 39kg/m² = **37.9**; 30kg/m² = **46.6**

Birds generally have sufficient food formulated for a balanced diet. Water is well supplied. However, there is little choice for birds. In the last third of their life, birds are not able to move very well due to their weight and size and crowding due to the stocking density of around 17 birds per square metre growing to 2.2 kg per bird. The environment is relatively barren (not withstanding some enrichment, for example with the provision of straw bales). Space allowance becomes increasingly important as birds grow and particularly in the last week or two of life. Birds are likely to be disturbed when resting. Perch space is limited. Birds may be affected by heat stress in hot weather. Leg and bone weakness problems are common (e.g. causing lameness). Birds may also suffer from pododermatitis, hock burn, metabolic conditions, such as ascites, and other conditions. Flocks are vaccinated against common diseases. Birds may suffer pain, for example from injuries, catching, transportation and at slaughter (e.g. from shackling).

There are considerable limitations for birds to perform normal social or other behaviours. Although, it is not known the extent to which the desire to perform certain behaviours may have been reduced by genetic selection. In general, there is little human-animal contact and what there is tends to be a negative experience for birds. There are few opportunities for positive welfare experiences for animals.

The increase in space (to 30kg/m²) provides the potential for some better access to food and water, greater comfort (e.g. while resting), more space to move and more opportunity for normal behaviours. It may also result in a reduction in injuries and may have benefits in relation to lower levels of disease and disorders. An increase in space of 23% from 39 to 30 kg/m² still provides relatively little space for birds reaching maturity. Moreover, a relatively small increase in space alone may provide limited welfare benefits unless the potential to provide for other measures, such as environmental enrichment, is utilized.

Policy case study: Use of farrowing crates in indoor pig production

Aggregate scores: Current practice = **26.8**; Limited crate use = **34.3**; Free farrowing = **46.6**

These scenarios consider indoor pig production systems in the UK and include consideration not only of the welfare of sows but also piglets and fattening/finishing of pigs.

Approximately 25% of a sow's life is spent in farrowing crates. Sows are very restricted during that period and generally experience a lack of comfort and inability to freely move with associated injuries, potential thermal discomfort (e.g. they cannot move to cool down), and sows are unable to undertake a number of normal behaviours.

Limited use of crates (used for a few days only) reduces the time that sows spend in crates which has some welfare advantages compared to current use of crates, whilst free farrowing has a likely greater positive impact on welfare. The extent to which free farrowing has welfare benefits depends on the exact nature of the system used of which there is a number of options.

However, the environment for both sows and piglets is likely to remain lacking in comfort and highly restrictive in terms of social behaviours and other normal behaviours. Pigs are social animals and have a high cognitive ability which is not accommodated by current mainstream indoor pig production.

Fattening and finishing is also often undertaken in barren, crowded and uncomfortable environments for pigs with little opportunity to undertake normal behaviours. Pig housing varies greatly. Around a third of finishing pigs are kept on slatted/concrete floors to allow slurry drainage whilst around two-thirds are kept in straw-based systems which can be more comfortable for pigs and allow greater opportunity for some normal behaviours such as rooting. Pigs may undergo a number of painful procedures including tail docking and castration and can suffer from a number of injuries (knocks, tail biting etc), conditions and diseases including PRRS and respiratory diseases such as enzootic pneumonia, and swine dysentery. There are also welfare compromises associated with slaughter and the use of carbon dioxide.

Policy case study: Lameness in dairy cows (current vs reduction to 5% scores 2/3)

Aggregate scores: Current practice = **43.1**; Reduction to 5% lameness = **56.1**

In relation to food, there is an ongoing challenge of negative energy balances for high-yielding dairy cows. Lamé cows may be less competitive for food and water. Water is generally well-provided but calves may not have sufficient access when separated from their mothers.

Bedding areas for cows are often hard and uncomfortable with narrow cubicles. Outside may be wet and muddy. Standing on concrete is uncomfortable for cows. Lamé cows may not be able to move freely. Around 30% of cows are lame at any one time.

Cows may suffer from bone fractures, skin disorders, hock and knee injuries, bruises and ulcers. Diseases include digital dermatitis, mastitis, Johnes, BVD, bovine TB etc. Lamé cows are likely to experience pain as are cows with mastitis, cows drying off (which can be painful), animals subject to rough handling and management procedures (e.g. disbudding), cows with birthing difficulties and casualty animals.

Normal social behaviour is restricted for calves and cows due to early calf separation. There is a general lack of choice in relation to normal behaviours. There is often little opportunity for normal social behaviour for cows and calves. However, most calves and cows will form social groups. Lamé cows may be bullied. Inside is a relatively barren environment. Human-animal interactions can be both good and poor and may be a source of pain and distress.

A reduction in lameness improves cow welfare but there remain welfare compromises in the system.

Policy case study: Sheep – lamb castration (current practice, mandatory pain relief, no castration)

Aggregate scores: Current practice = **52.7**; Castration with pain relief = **55.6**; No castration = **60.0**

There is a large range of body condition scores in the sheep (ewes, lambs etc) population. Feeding provision will vary depending on weather conditions etc. Provision of feeding for lactating ewes can be an issue. Some farms do not supply water.

Comfort may be weather compromised (e.g. lying in wet/muddy conditions) but tends to be good for animals inside. Recently castrated lambs may not feel as well and will suffer discomfort. There is the risk of hypothermia for young lambs outside. Animals generally have plenty of space except when penned.

Sheep can suffer from a large range of injuries, conditions, diseases (30 common ones) and disorders (e.g. lameness/foot rot, scab, fly strike, lungworm) which in some cases may not be picked up for some time. Some of these will not be treated. Lambs can remain largely healthy throughout their short lives. Pain can be severe and acute in a number of lambs due to castration, tail docking, ear tagging etc. Non-stun slaughter is a source of additional pain.

Sheep and lambs have opportunities to express social and other normal behaviours with opportunities for positive welfare experiences (e.g. play). Pain due to castration may affect social interaction. Handling is not always good and may be accompanied by fear and distress.

Pain relief can vary in how effective it is but can improve comfort for castrated lambs (and in relation to other procedures such as tail docking) during the period. Pain relief can not only reduce pain but also result in some improvements to a number of welfare considerations, such as the ability to undertake normal behaviours, for the time during which the lamb is affected (which may vary from a week or so to longer).

No castration brings welfare benefits of reduced pain and associated positive impacts but some farmers may need to change their system and separate, and perhaps house, male lambs which may have some associated negative welfare implications (e.g. as a result of earlier separation and segregation of male lambs). Other procedures such as tail docking would continue to cause pain and distress.

Policy case study: Beef cattle (current lameness vs reduction to 3%)

Aggregate scores: Current practice = **58.5**; Reduction in lameness to 3% = **64.2**

Beef production is a complex mix of different systems involving suckler herds and suckler-bred calves (lowland and upland), dairy-bred calves (dairy bulls and beef-cross calves), fattening of store cattle (buying of dairy-cross steers and heifers at around 6 months before sale/transfer for finishing), summer and winter finishing enterprises (dairy-bred or suckler-bred stores), cereal bull beef, maize and grass silage beef finishing etc and often trade in animals between farms for relatively short periods of time.

Data on lameness in beef cattle are lacking. Estimates of lameness in beef cattle come from few studies with relatively small samples. Generally, beef farmers do not monitor their cattle for lameness or mobility score (unlike the dairy sector), leading to a likelihood that lameness often goes unrecorded. Estimates of current levels of lameness used in this policy case study are taken from Tunstall et al. (2021) with prevalence of 8.3% in finishing cattle and 14.2% in suckler cows (it is assumed that this refers to animals with equivalent mobility scores 2 and 3).

However, an uncited study by Liverpool University notes lameness rates of at least 20% in a sample of finishing cattle at time of slaughter.

Welfare impacts related to feeding include restricted feeding of milk to calves weaned early and the risk of metabolic issues for intensively finished cattle. Lameness may affect feeding. Generally, animals have reasonable to good access to water but often this may be in the form of a natural water course such as a stream.

Comfort when resting depends on bedding quality for indoor cattle and weather/land condition when outdoors. Indoors, some cattle are not well-bedded and slats are often not comfortable. Coverage of slats with a rubber surface may result in animals lying in slurry. Animals (especially calves) may have problems keeping warm in winter whilst densely stocked indoor finishing could result in heat stress when outside temperatures are high.

There is a number of common diseases and conditions that can affect beef animals. These include calf scours and respiratory disorders/disease, endo- and ecto-parasites, lameness, BVD and bovine TB. These, together with various injuries, may go unrecognized and/or untreated for some time in extensive systems due to a lack of close monitoring and farmers often waiting to inspect and treat animals until they are brought in from pasture. Animals will also suffer pain from various incidents, such as from slips and falls, and procedures such as disbudding, castration and caesarean births together with conditions such as lameness.

Although normal behaviours are restricted, extensive systems/periods provide greater opportunity for social and other normal behaviours (e.g. foraging, exploring) compared to many intensive systems. Indoor environments for beef cattle tend to have little enrichment. On balance, cattle are thought to have a negative human-animal relationship due to the nature of cattle handling and management procedures.

A reduction in lameness to 3% is likely to require a range of system and cattle management changes to achieve (such as improved housing and bedding, greater attention to monitoring and treatment of lameness etc). This is likely to result in general improvements in beef cattle welfare across welfare Criteria.

Reference: Tunstall, J., Mueller, K., Grove-White, D., Oultram, J. and Higgins, H. (2021) Lameness in beef cattle: a cross-sectional descriptive survey of on-farm practices and approaches. *Frontiers in Veterinary Science* Vol 8 [Frontiers | Lameness in Beef Cattle: A Cross-Sectional Descriptive Survey of On-Farm Practices and Approaches \(frontiersin.org\)](https://www.frontiersin.org/articles/10.3389/fvets.2021.682111/full)

Policy case study: Laying hen egg production (including chick/pullet rearing stage)

Aggregate scores: Colony cages = **32.2**; Barn = **43.8**; Free-range = **51.3**

This involved assessment of three scenarios: Current colony cage production; Current barn production; Current free-range production (not including organic).

Colony cages

Food is generally sufficient for hens with a good balanced ration, although access may be limited for some birds due to competition and there is little variation in the food provided (although birds fed mash potentially have more interest and opportunity for normal feeding behaviour). Lack of dietary calcium for birds generally. Birds with any injuries or conditions may not be able to feed properly. There may be poor feeding provision at end of lay (to save costs) especially over the last few days. Water supply is good and generally well monitored. Nipple

drinkers may become dirty and are probably not the form of water provision that birds would prefer.

Sloping wire floors provide little comfort for birds (e.g. when resting), with limited choice of perches and birds may be disturbed by others. Limited space and choice compared to more natural environments.

Thermal regulation for birds may be constrained by confinement but is largely satisfactory except in high external temperatures although may be more challenging for birds housed higher up in tiered systems. Thermal regulation during transport can be compromised.

There is limited space and height for bird movement (although birds do not uniformly fill the space providing greater space in some areas at times) with disturbance for birds at rest and constraints to normal behaviour (such as full wing flapping). Birds have more space during the rearing period (when reared on the floor) but most of the birds' life is spent in cages.

Birds can suffer from various injuries (e.g. from capture or from other birds), bone fractures (e.g. keel bone) and skin and other conditions. In relation to disease, hens are vaccinated against common diseases and hygiene is generally good. Around 50% of birds are thought to be affected by some disease of some kind. Flocks are treated for disease but not individual birds. Birds culled due to AI control suffer welfare compromise.

Birds can experience pain from a number of sources including procedures such as beak trimming, injurious pecking, depopulation, various injuries, conditions and diseases and slaughter (from inversion, shackles, ineffective stunning).

Birds have little social choice and little opportunity for normal behaviours such as foraging, exploring and dust bathing. They do not have positive human-animal relations but rather negative in relation to various procedures and management, although birds are handled for a relatively short period of time throughout their lives.

Additional considerations include high levels of noise, poor ventilation, non-optimum lighting (for welfare) and a lack of opportunities for positive welfare.

Barn

Birds kept in barn systems have similar satisfactory experiences of food and water as in colony cages but may have a little more choice in terms of access.

Birds have limited space, are unlikely to find perches comfortable, but may experience less disturbance at night.

Thermal regulation is potentially challenging but there is more opportunity for birds to regulate their temperature compared to cage systems.

Birds have more opportunity to move and range compared to colony cages but stocking density is still high.

There can be higher levels of foot disorders, keel bone fractures, injuries and skin and feather damage in barn systems. There is also generally more infectious disease in barn systems and lower hygiene although disease is generally well-controlled.

An increase in the severity and prevalence of keel bone fractures in barn systems produce an increase in pain severity for birds. Pain as a result of handling and smothering is greater.

Although birds have more space they are still restricted but there is greater opportunity for birds to express normal behaviours (e.g. dust bathing).

The human-animal relationship is similar to that in colony cage systems.

Additional considerations include an increase in air pollutants in barn systems but a slight improvement in the sensory environment for birds compared to colony cages.

Free-range

There is an increase in the variety, choice and interest of food sources and in the ability to forage compared to cage and barn systems. Water provision is much the same as other systems in terms of welfare.

Birds have more space and greater choice of where to rest. There is an increase in the availability of arial perches for birds. Birds can get wet and cold with exposure to the outside and increased risk of heat stress outside in hot weather. However, although birds have a substantial increase in space with access to the outside, they often choose not to go outside.

Injuries, such as bone fractures, are variable. Generally, birds have better bone density because of greater exercise. There is a higher risk of some diseases ranging from coccidiosis and parasites to AI but a lower risk of some conditions/disease such as fatty liver disease. Birds can suffer pain due to increased severity of injuries due to collisions, handling, some smothering and some predation.

Birds have greater opportunity for normal social and other behaviours, largely due to the increased space and opportunities for environmental enrichment.

The human-animal relationship is similar to colony and barn systems. Although there is, arguably, greater potential for a positive relationship, this is mostly not used (except in some smaller flocks).

Other considerations include better air quality and higher potential for positive welfare and increased sensory experiences in free-range systems.