



Opinion on the welfare implications of different methods and systems for the catching, carrying, collecting and loading of poultry

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Animal Welfare Committee
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Introduction

1. The Farm Animal Welfare Committee (FAWC) traditionally provided detailed expert advice to Ministers in Defra and the Scottish and Welsh Governments on the welfare of farmed animals on farm, at market, during transport and at slaughter. In October 2019, FAWC was renamed the Animal Welfare Committee (AWC) and its remit was expanded to include companion animals and wild animals kept by people, as well as farm animals. This enables it to provide authoritative advice, which is based on scientific research, stakeholder consultation and experience, on a wider range of animal welfare issues.

Scope

2. AWC has been asked to consider the welfare issues associated with the manual catching and carrying of poultry, mechanized poultry collectors and loading stations, and poultry container systems used in commercial transport. This Opinion considers chickens (*Gallus gallus domesticus*) used for broiler, broiler breeder and laying hen egg production and all systems for these that are currently permitted in GB. It also considers turkeys (*Meleagris gallopavo domesticus*) and ducks (*Anas platyrhynchos domesticus*).

3. Issues related to the manual catching and carrying of poultry include: the direct welfare implications of different catching methods; any effects of these on catching or carrying durations and their impacts on animal welfare; the effects on the welfare of birds held in transport containers or on vehicles while catching takes place; and which method provides the highest potential level of welfare. The main catching and carrying methods to be compared are: 1) catching, lifting and carrying by the body and holding upright; and 2) catching, lifting and carrying by both legs. Although catching and carrying by one leg is not a recommended method in the relevant Codes of Practice and Guidance, AWC has been asked to report on how common this method is.

4. Issues related to mechanized poultry collectors and loading stations include: understanding the current and likely future extents of mechanized systems in GB; the positive and negative welfare impacts of these and the risks they pose to birds; loader conveyors and container designs; the relationship between the make and design of this equipment and welfare outcomes; whether mechanized systems deliver welfare outcomes that are higher or lower than those resulting from a manual catching method; any additional handling that occurs during mechanized catching; and which mechanized methods, if any, may deliver higher welfare.

5. Issues related to poultry container systems used for transport include: the welfare risks resulting from container design, and possible changes that might reduce these; the method of loading filled containers on site and on vehicles, how this impacts bird welfare and what changes may reduce welfare risks; and which container design and loading method delivers the highest potential level of welfare.

6. This Opinion does not cover the catching or carrying of chicks for any purpose. Nor does it cover the picking up of individual sick or injured birds, which are likely to

be immobile or slow-moving and so cannot be said to be 'caught' under the definition given below (see 9). At catching, such birds will normally be killed in the shed by cervical dislocation, subject to defined legal limits on bird weight and bird numbers.

7. FAWC has previously made recommendations relating to the catching, carrying and loading of poultry.¹ These particularly addressed the training of catchers, the temperature and humidity experienced by birds loaded into modules and the monitoring of these, appropriate stocking densities based on these variables and mechanical ventilation. FAWC also scrutinized and quality assured the welfare Codes for England and Wales and Guidance for Scotland for Meat Chickens and Meat Breeding Chickens and for Laying Hens and Pullets.

8. The immediate context in which AWC's advice has now been sought is a discrepancy between the requirements of retained EU legislation on the protection of animals during transport (see 18) and the advice in the statutory on-farm welfare Codes and Guidance relating to the catching and carrying of chickens raised for meat (see 24) and eggs (see 26). The relevant EU legislation prohibits lifting any animal by the legs, whereas both sets of Codes and Guidance suggest that chickens may be lifted by both legs. However, the scope that AWC has been given also extends more widely to encompass a range of welfare issues related to the catching, carrying, collecting and loading of poultry (see 58).

Definitions

9. In this Opinion, key terms are used as follows:

- carrying: the moving of a bird by human hands
- catching: the act of bringing a bird that is moving, or able to move, under direct physical control by human means
- chicken: a bird of the species *Gallus gallus domesticus* used for any production purpose
- collection: the moving of poultry by mechanical means from their shed to the point of loading
- container: a tray or crate into which poultry are placed for transportation
- harvesting: the catching, carrying and loading of poultry on farm for transportation to the point of slaughter or killing
- loading: the placing of a bird into a tray, drawer or crate
- module: a metal frame into which multiple trays may be inserted
- thinning: the removal of a proportion of broiler chickens from a barn for early slaughter
- tray: a wide and shallow open container for poultry that, when inserted into a module, functions as a drawer

¹ Opinion on the Welfare of Animals during Transport, April 2019.

Climate change

10. Shifting weather patterns attributable to climate change are affecting all farmed species. These include high temperatures, rapid and unpredictable temperature fluctuations, high and low rainfall, strong winds, and increased sunlight and humidity. Greater contingency planning may be required to safeguard animal welfare against extreme weather events such as drought or flooding. In addition, physiological changes to farmed species (for example reduced ability to thermoregulate, paragraph 125) may result in climate change having greater impact on their welfare unless such effects are mitigated.

11. For housed animals, the effects of climate change may be mitigated by improved building design, temperature-controlled ventilation of buildings using fans, cooling pads and sprinklers, on-site water storage, increased artificial lighting and reduced use of transparent roof panelling. In hot weather, an animal's higher water intake requirements need to be reliably met.

12. When outdoors and at harvesting, poultry may require improved provision of shelter from direct rain, wind, sun and heat. During transportation they require appropriate ventilation, ambient temperature and humidity, with lower stocking densities potentially mitigating the effects of higher temperatures. Local microclimates may either reduce or intensify climate change impacts. These general welfare aspects of climate change, which have different effects on different farmed species, are further addressed in the relevant sections of this Opinion.

Legal context

13. Under the Animal Welfare Act 2006, section 4 in England and Wales and the Animal Health and Welfare (Scotland) Act 2006, section 19, it is an offence for a person to cause or permit unnecessary suffering to any domesticated animal for which they are responsible. Under the same Acts, sections 9 and 24 respectively, a person commits an offence if they do not take reasonable steps given the circumstances to ensure that an animal's needs for a suitable diet and protection from pain², suffering, injury and disease are met to the extent required by good practice.

14. The retained Council Regulation 1/2005, chapter 1, article 3, on the protection of animals during transport and related operations, states that animals to be transported must be fit for the journey; that the means of transport and loading and unloading facilities must be designed, constructed, maintained and operated to avoid injury and suffering and ensure animal safety; and that personnel handling animals are trained or competent as appropriate for this purpose and carry out their tasks without using any method likely to cause unnecessary fear, injury or suffering.

15. The same Regulation, Annex I, chapter 2, section 1.1, states that means of transport, containers³ and their fittings must be designed and operated to a) avoid injury and suffering and to ensure the safety of animals; b) protect animals from

² Pain is absent from the Scottish legislation.

³ In this Regulation, a container is defined as any crate, box, receptacle or other rigid structure used for the transport of animals that is not a means of transport.

inclement weather, extreme temperatures and adverse changes in climatic conditions; . . . e) ensure that air quality and quantity appropriate to the species can be maintained; f) provide access to the animals to allow them to be inspected and cared for; g) present a flooring surface that is anti-slip; h) present a flooring surface that minimizes the leakage of urine or faeces; and i) provide a means of lighting sufficient for inspection and care of the animals during transport.

16. The same Regulation, Annex I, chapter 3, section 1.7, states that, when containers containing poultry are placed on top of one another, precautions must be taken to limit urine and faeces falling on those placed underneath, ensure stability of the containers and ensure that ventilation is maintained.

17. The same Regulation, Annex I, chapter 3, section 1.8 (b), prohibits applying pressure to any particularly sensitive part of an animal's body in such a way as to cause it unnecessary pain or suffering.

18. The same Regulation, Annex I, chapter 3, section 1.8 (d), prohibits lifting any animal by the legs or handling it in such a way as to cause it unnecessary pain or suffering. No exception is made for poultry.

19. The same Regulation, Annex I, chapter 7, section E, lays down minimum floor areas for poultry (other than day-old chicks) during transport. These are expressed in cm² per kg of combined weight relative to the body weight of individual birds.

20. The Welfare of Farmed Animals Regulations (WoFAR) (England and Wales 2007), Schedule 4, paragraph 5 and The Welfare of Farmed Animals (Scotland) Regulations 2019, Schedule 3, paragraph 15 (additional conditions that apply to the keeping of laying hens in enriched cages) state that, to facilitate inspection, installation and the depopulation of hens, there must be a minimum aisle width of 90 cm between tiers of cages and that a space of at least 35 cm must be allowed between the floor of the building and the bottom tier of cages.

21. WoFAR (England and Wales 2007), Schedule 5, paragraph 6 (additional conditions applicable to all systems in which laying hens are kept), states that accommodation comprising two or more tiers of cages must have devices, or appropriate measures must be taken, to allow the inspection of all tiers without difficulty and to facilitate the removal of hens. Paragraph 7 states that the design and dimensions of the cage door must be such that an adult hen can be removed without undergoing unnecessary suffering or sustaining injury. These requirements are also included in WoFAR (Scotland) 2019, Schedule 3, paragraphs 7 and 8.

22. The Code of Practice for the Welfare of Meat Chickens and Meat Breeding Chickens (2018) for England closely corresponds with a similar Code for Wales (2020) and Guidance for Scotland (2019). Paragraph 18 states that catching and carrying should only be undertaken by competent persons who have been appropriately trained and have received clear guidance and instructions from the owner or keeper. Paragraph 19 states that mechanical bird collection systems should be regularly monitored and their effect on welfare regularly evaluated.

23. The same Code, paragraph 20, states: 'High standards must be applied during catching and carrying irrespective of the potential economic value of the birds. Surplus meat chickens, including breeders at the end of lay awaiting disposal, should be treated as humanely as those intended for retention or sale.' Paragraph 21 states that catching and carrying should be carried out quietly and confidently, with care exercised to avoid unnecessary struggling, which could bruise or otherwise injure birds.

24. The same Code, paragraph 22, states: 'Birds must be caught with care and should be lifted directly into the transport module. Catching should either be by holding them round the body or, if by the legs, by both legs. If birds need to be carried, this should either be by holding them round the body or by both legs. No catcher should carry by the legs more than three chickens (or two adult breeding birds) in each hand. Birds must not be carried by the wings or by the neck.' In the Guidance for Scotland, the middle part of the same paragraph states: 'Catching should either be by holding them round the body or, if by the legs, preferably both legs above the hock joint. If birds need to be carried this should either be by holding them round the body or by both legs above the hock joint.'

25. The Code of Practice for the Welfare of Laying Hens and Pullets (2018) for England also closely corresponds with a similar Code for Wales (2020) and Guidance for Scotland (2019). Paragraph 120 states that catching and carrying should be carried out quietly and by confidently exercising care to avoid unnecessary struggling, which could bruise or otherwise injure birds. Paragraph 123 states that any hindrance from fixtures and fittings, especially sharp edges and protrusions, must be removed, and that care must be taken throughout the catching process to avoid panic and subsequent injury and smothering, such as by reducing light intensity or by using blue or red light.

26. The same Code, paragraph 124, states: 'When catching laying hens in cages, they must be removed from the cage singly to avoid injury or suffering and must be held by both legs. The breast should be supported during removal from the cage. Hens in non-cage systems must also be caught and held by both legs. In all systems, hens should only be carried by both legs and care should be taken to avoid hitting solid objects particularly if wings are flapping. They must not be carried by their wings, head, tail or neck. The number of hens carried will depend upon the size of the hen and the ability of the carrier, but a maximum of three per hand must not be exceeded. Distances which hens are carried should be minimised as far as possible, for example, by bringing transport containers as close as possible to the hens.'

27. The same Code, paragraph 125, states: 'Transport containers with large openings should be used for pullets and hens to avoid damage to the birds; the design, size and state of repair of any container used to carry birds must allow them to be put in, conveyed and taken out without injury. The condition of crates should be checked and, where broken crates are identified, they must not be used. Care should also be taken when crates are loaded onto vehicles, and in their transportation and unloading, to avoid physically shocking the birds.'

28. The same Code, paragraph 126, states: 'During the time birds are held in the containers prior to and after transport they should be protected from bad weather and excessively hot or cold conditions. Birds should not be allowed to become heat

stressed (as indicated by prolonged panting) by being left in containers exposed to strong direct sunlight, nor should they be exposed to cold stress due to inadequate protection from rain and high winds. Adequate ventilation for the hens is essential at all times.'

29. The Codes of Recommendations for the Welfare of Livestock: Turkeys (1987), which applies to England, Wales and Scotland, paragraph 58, states: 'The proper handling of birds requires skill, and it should be undertaken only by competent persons who have appropriately trained. It should be carried out quietly and confidently, exercising care to avoid unnecessary struggling which could bruise or otherwise injure the birds. Care must be taken in catching birds in loose-housed systems in order to avoid creating panic and subsequent injury to or smothering of the birds. Particular care is also needed so as to avoid injury to birds being placed in or removed from cages, especially where the whole of the cage front does not open.'

30. The Codes of Recommendations for the Welfare of Livestock: Ducks (1987), which applies to England, Wales and Scotland, paragraph 53, states: 'The proper handling of ducks requires skill and it should be undertaken only by competent persons who have appropriately trained. It should be carried out quietly and confidently, exercising care to avoid unnecessary struggling which could bruise or otherwise injure the ducks. . . . It may be necessary to catch older ducks by the neck and they should be supported either by taking the weight of the bird by a hand placed under its body, or by holding the bird with a hand on either side of its body with the wings in the closed position. Birds should never be carried by the legs.'

Background

31. Poultry may be caught and handled for a range of purposes. These include pullet delivery to the laying house, the weighing of birds for growth monitoring, broilers, ducks and turkeys being taken for slaughter for human consumption and the killing or depopulation of layers or broiler breeders that have reached the end of their productive life.

32. In GB, approximately 95% of the livestock that are handled each year are poultry. The vast majority (approximately 96%) of poultry that are caught and handled are broilers for slaughter for human consumption. During a recent sample week, 18,353,961 broilers, 394,500 spent hens, 176,472 turkeys and 196,651 other poultry (including ducks) were slaughtered or killed in England and Wales⁴ These figures suggest that, in a typical year, more than 1 billion poultry birds are caught and handled in GB in commercial settings.

33. Egg production figures for 2022 indicate that 64% of eggs were from free-range (including organic) hens, 29% were from caged hens and 7% were from hens housed in barns.⁵ Assuming roughly similar production levels across these systems, approximately 1.4% of poultry caught and handled are free-range or barn layer hens

⁴ FSA Slaughter Sector Survey 2022, at <https://www.gov.uk/government/publications/farm-animals-slaughter-sector-survey-2022>.

⁵ <https://www.gov.uk/government/statistics/egg-statistics/quarterly-uk-statistics-about-eggs-statistics-notice-data-to-december-2022>

and 0.8% are caged layer hens. The size and proportion of free-range egg production is steadily rising, from 47% in 2011 to 64% in 2022.

34. Commercially bred chickens have a short lifespan relative to other farmed species (30 to 40 days for many broilers and 72 to 80+ weeks for layers). Ducks farmed for meat are typically slaughtered at approximately 42 to 56 days with those farmed for eggs killed at approximately 80 weeks. Meat turkeys are slaughtered at approximately 80 to 140 days depending on the weight required.

35. Poultry that are commercially reared at scale experience little significant handling by humans. Catching and carrying therefore represent major deviations from their day-to-day norm for which birds are not prepared by prior exposure or habituation. These activities are therefore likely to be stressful, as shown by observable behavioural indicators such as flocking, increased frequency of wing flapping, vocalizing and tonic immobility inductions, which may indicate fear. These visible indicators are supported by physiological markers including, in chickens, increased respiration rate, raised comb and cloacal temperatures and elevated corticosterone levels.⁶ Catching activity can provoke behavioural responses that cause injury, or even death, from smothering.

36. In chickens, stress can initiate the shedding of *Campylobacter* or increase the rate of existing shedding. This can have serious negative impacts on the health of workers and consumers, particularly the immune suppressed and young children. The greatest disease risk is presented at thinning, when bacteria shed by the birds being caught or collected (for example in faeces) may infect the remaining birds. A time period of several days is available for bacterial multiplication before final catching or collecting.

37. Prior to manual or mechanized catching commencing, the shed is walked with birds unfit to travel identified, removed and culled by a person responsible and competent for this task (usually the producer). In a broiler barn, the feeder and drinking lines, which are suspended on steel wires from the barn roof, are lifted so that modules with containers may be moved into the bird areas. This also reduces the injury risk to birds and removes trip hazards from the catchers. In an open laying barn, side access doors onto litter areas allow modules containing trays to be moved close to where end-of-lay hens will be caught.

38. On broiler farms it is common practice to perform thinning, where up to a third of birds are caught for slaughter, at approximately 31 days of age, with the remainder caught at approximately 40 days of age. A partition (for example fencing, straw bales, crates) may be used to segregate the birds to be caught from those that will remain and is common in some countries. This protects the remaining birds from injury, noise, dust and drafts, while maintaining appropriate stocking density. In advance of catching, feed and water are withdrawn (see 37) from all birds in the shed, then returned for those birds that remain.

⁶ C Gerpe, A Stratmann, R Bruckmaier and MJ Toscano. Examining the catching, carrying, and crating process during depopulation of end-of-lay hens. *Journal of Applied Poultry Research* 30 (2021), 100115.

39. When pullets are caught and loaded, some may remain in the shed if not all the birds can be removed at one time. The birds remaining will also require feeding and watering.

40. Slower-growing broiler breeds, and layer breeds, are believed by some to be flightier and therefore harder to catch.

41. In GB, chickens have traditionally been caught during hours of darkness, on the grounds that it is easier to catch them in low light conditions because they are calmer in these conditions. However, slaughterhouses require birds to be delivered throughout their processing hours throughout all seasons. During catching in broiler sheds during daylight hours, windows and entry doors are screened to minimise light ingress. When lighting is needed, dim red or blue headtorches and lighting are used to reduce fear reactions in birds. This may be difficult in sheds with natural light entering due to blinds being ineffective in keeping light out. There will also be significant light leakage through vent inlets and fan housing. In some countries it is common for chickens to be caught in daylight, and this appears to work satisfactorily with the breeds reared in these locations.

42. For laying hens, assurance schemes may require a depopulation action plan covering matters such as building design, named responsibility for roles, catching, transport, dead-on-arrival counting and feedback and record keeping.

43. Where broilers and end-of-lay hens are placed into modules or crates inside the shed then moved outdoors for loading in cold weather conditions, they will experience a sudden and large drop in ambient temperature. This will be exacerbated by exposure to water droplets on trays or crates remaining from cleaning and/or disinfection and especially to rain. Any water in trays or crates may freeze, leading to further chilling as well as a slip hazard. Once a transport vehicle is in motion, these hazards are likely to be increased.

44. Pullets and end-of-lay hens are preferably unloaded or loaded inside the shed with dollies used to bring trays or crates alongside the cages or tiers. However, due to restricted space in older sheds with cages, this may not be possible, and birds will need to be carried from or to an outdoor unloading or loading point. This may result in individual birds experiencing a sudden and large change in ambient temperature. AWC understands that the practice of passing end-of-lay birds along extended 'human chains' from cages to loading is now rare. For any outdoor unloading or loading site, well-constructed shelter will protect birds from rain, snow, wind and sun.

45. Currently, when birds are loaded into a module, any that are trapped or injured should, as appropriate, either receive immediate care or be humanely killed. Although culls must be recorded, with records kept for three years and available for inspection, the reasons for culls do not currently have to be recorded and the recording system is paper based. This makes cull data of limited use for assessing welfare at catching, carrying and loading.

46. As a manual catching operation continues, catcher fatigue, both physical and mental, as well as real, and perceived, time pressures are likely to increase the risk of

welfare harms. During a shift, a catcher is likely to lift 5 to 10 tonnes of birds.⁷ Body cameras that include a night vision capability may provide information about a catching and loading operation that is useful for training and monitoring purposes and for influencing the behaviour of catchers.

47. In the event of exceptional circumstances such as slaughterhouse capacity being reached or operational problems in a slaughterhouse, and no alternative slaughterhouse being available, caught and loaded birds might need to be returned to the shed and unloaded. This requires Animal and Plant Health Agency (APHA) permission, which is obtainable by telephone in conjunction with a risk assessment being completed. Before any return of birds to the shed, the catch will need to be halted. Water and feed will probably need to be returned to the birds. The birds will then need to be recaptured and reloaded very soon, before the on-farm food supply for the projected rearing period is exhausted and before the birds reach a weight at which, if they remain on site, stocking density limits will be exceeded.

48. In this situation, the stress caused by the additional travel, unloading and handling may be greater than that resulting from leaving the birds on the vehicle while it is stationary. Birds loaded on a vehicle cannot be watered or fed and an appropriate ambient temperature and ventilation cannot be provided. In order to maintain ventilation, the vehicle may be driven around or parked in a ventilated lairage.

49. APHA inspectors and local authorities inspect farms to check that requirements relating to bird welfare are being met. Enforcement is the responsibility of local authorities but, for poultry catching, carrying and loading, rarely, if ever, occurs. Assurance scheme representatives may visit premises, but assurance schemes have no legal enforcement mandate.

Manual catching and carrying

50. Manual catching is the catching of a bird by a human using their hands. It potentially includes the following methods: around the body, under the abdomen, by two legs only, by one leg only, by both legs or one leg in one hand supporting the weight of the bird in the other hand, and, for ducks, briefly by the neck.

51. Broiler chickens are now typically caught at both younger ages and heavier weights than previously. Over the past 80 years, weight at slaughter has nearly doubled and age at slaughter has almost halved. Catching practices, including inversion, need to be reviewed in light of the muscular development of chickens at these younger ages and in view of increased growth rates. This has been part of the reason for the move to recommending catching and carrying by two legs in GB rather than catching and carrying by one leg.

52. In GB, catching is normally undertaken by a catching team comprising approximately 6–10 members of which all members should be trained. The British Poultry Council basic training is the Poultry Passport level 1 short course. In GB, there are currently approximately 15 recognized training companies. Some assurance

⁷ S Ramasamy, ER Benson and GL Van Wicklen. Efficiency of a commercial mechanical chicken catching system. *Journal of Applied Poultry Research* 13 (2004), 19–28.

schemes require that they approve catching teams and suggest that training should be externally validated. AWC understands that training for catching broilers and end-of-lay hens is sometimes delivered online only.

53. Catching teams should be organised with an assigned leader and at least one senior member. Members new to the job may be assigned a 'buddy'.

54. In loose-housed systems, pullets may be driven into portable pens to aid catching. In free-range broiler systems, to reduce the carrying distance, birds that are housed inside at night will be kept inside for catching. Catching birds outside is difficult because they exhibit escape behaviours, which are indicators of stress.

55. In caged housing, feed and water may remain available during the catching period. This is likely to result in a potentially reduced stress duration for birds caught later, as well as in reduced durations of waiting and feed and water withdrawal for birds already caught and loaded into a container. Due to metabolic exhaustion, end-of-lay hens are at particular risk of hunger (more than 10 hours feed withdrawal) and thirst (more than 6 hours water withdrawal).⁸

56. When premises are depopulated for notifiable disease control purposes, APHA veterinary surgeons are present to observe catching, carrying and loading. They produce welfare reports, which are an important source of welfare information because depopulation is the only occasion when veterinary surgeons are present to observe these activities. Catchers working for notifiable disease control purposes may feel particular time pressures. The main issues reported are rough handling of birds and catching teams not following correct procedures or instructions. Even where CCTV is installed, a team may observe required practice when beginning the catch but fail to follow it later when they think the veterinary surgeon is not looking. This is partly because many aspects of catching and carrying cannot be adequately viewed by CCTV. It suggests that the only effective means of monitoring welfare at catching, carrying and loading and of ensuring that legal requirements are met is oversight by an independent qualified person (for example from a local authority) who may sometimes be present on site.

57. Bird injuries and deaths identified at slaughterhouses are reported by Official Veterinarians (OVs) employed by the Food Standards Agency (FSA) to the APHA using an online portal. The reports include details of the farm, catching team and haulier. Reports may include photographic evidence and an ante- or post-mortem report. Categorisation at level 4 indicates that a welfare breach has caused pain. In order to provide a full report, the OV will need to be in possession of all the necessary equipment (for example camera, surgical instruments) and records. The types of incidents likely to be due to catching, carrying and loading damage include head crushing, fractures of the femur and tibia bones, hip and hock joint dislocations, open and closed fractured or bruised wings, wing tip damage with haemorrhage, tearing of the peroneus longus and other muscles, and body bruising.

Description of commonly used methods for chickens

⁸ EFSA Panel on Animal Health and Welfare, Welfare of domestic birds and rabbits transported in containers, 2022.

58. *Catching, lifting and carrying upright with two hands pinning the wings against the body.* This is known as the 'rugby ball' grip. A single bird is lifted and remains upright, with the catcher holding the bird's wings against its body to prevent flapping.

59. *Catching, lifting and carrying upright with one hand placed under the abdomen.* A bird is lifted and restricted by the catcher grasping both legs and its weight is supported by a hand placed under its abdomen. A second bird may be similarly picked up and held in the other hand, with the birds rested against the catcher's body and their outer wing and leg movement controlled by the catcher's arm and hand and their inner wing and leg movement restricted by the presence of the other bird.

60. *Catching, lifting and carrying inverted by two legs with the legs held between the fingers.* The catcher should pick up a bird by spreading their fingers so that each leg is secured between these and the legs are not squashed together. For birds at ground level, the catcher has to bend down low in order to grasp the bird carefully. When the bird is lifted, it becomes inverted and is held, along with other birds, against the catcher's legs, in order to reduce wing flapping. The maximum number of birds that Codes and Guidance state may be caught, lifted and carried in each hand is 3 (or 2 if they are adult broiler breeders) (see 24 and 26), although more than 2 is likely to be difficult in practice because only 4 legs can be held between the catcher's 5 fingers. In GB, some catching contracts specify that birds be caught by 2 legs.

61. *Catching, lifting and carrying inverted by one leg with the legs held between the fingers.* The catcher picks up a bird by spreading their fingers so that a leg is secured between these. Although birds are preferably held above the hock joint, they are often held around the lower shanks, just above the feet. For birds at ground level, the catcher has to bend down low. It is in principle possible for a catcher to catch, lift and carry up to 4 birds by one leg or foot each between their 5 fingers. Up to 3 birds are likely to be caught in each hand and are then carried and placed in the tray.

62. In GB, this method is commonly employed by catching companies for broiler chickens that are ready for slaughter and for laying hens that have reached the end of their productive life. It is not recommended in the welfare Codes of Practice for England and Wales or Guidance for Scotland. See also 18. A major provider of catching teams to broiler integrators reported to AWC a shorter catching, carrying and loading duration using its single-legged standard operating procedure than when catching by two legs. Industry generally has stated that catching by one leg is less strenuous for catchers than catching by two legs.

63. Due to the presence of physical obstructions, an upright method is likely to be used to remove end-of-lay hens from enriched cages, although they may then be inverted for carrying.

Description of commonly used methods for turkeys

64. Solid partitions may be used to separate the flock into smaller groups and to reduce sight lines into other areas of the barn. They may make catching easier and reduce the distance that turkeys are carried and the carrying duration.

65. Larger turkey poults of a similar weight to chickens are likely to be caught and carried by a method used for chickens (see 5861). Smaller and lighter turkeys that are ready for slaughter may be caught by both legs, lifted then turned upright. Stags, which are typically heavier than hens, are often lifted upright from ground level, being gently grasped with one of the catcher's arms placed over their shoulder and holding the wing while the catcher's other hand grasps one or both legs to support their body weight.

66. Heavier turkeys are preferably herded to the loading area and gently guided into the container or vehicle. This especially applies to large and heavy turkeys, which can be difficult to carry.

Description of commonly used methods for ducks

67. Because ducks are at high risk of hip dislocation and lameness, they should always be carried individually and never caught, lifted or carried by the leg(s). They are able to invert themselves when in water only because the water supports their body weight. Ducks may be caught and lifted either by the catcher placing one hand either side of the body, over the wings, or by the catcher gently lifting them up by the base of the neck, which reduces wing flapping and so injury risk, for a minimal time, in order to hold them by their body. AWC understands these to be the only catching, lifting and carrying methods for ducks that are used in GB and is content with them.

68. Ducks may be herded to a small loading area and contained there by catching fences. They may then be lifted by the neck straight into a tray or crate although should not be carried by the neck.

Evaluation of catching, lifting and carrying chickens and turkeys upright

69. Fear and stress are associated with any handling activity, resulting from the activation of innate anti-predator responses. In laying hens, even gentle lifting around the wings and cradling against the catcher's body results in a marked body surface temperature rise and plasma corticosterone response, indicating a physiological stress response.⁹ These stress responses to handling are unavoidable unless birds are gradually habituated to it, which is not possible in commercial flocks.

70. Lifting and carrying with two hands pinning the wings against the body (the 'rugby ball' grip) presents the lowest injury risk to a bird but allows only one to be lifted and carried at a time.

71. Catching and carrying one or two chickens upright is likely to take a catcher less time than catching and carrying four or more chickens inverted and so reduce the duration of the catching and loading process for those birds. Longer handling durations are likely to increase stress and the likelihood of injury due to agitation.¹⁰

⁹ KA Herborn, JL Graves, P Jerem, NP Evans, R Nager, DJ McCafferty and DE McKeegan. Skin temperature reveals the intensity of acute stress. *Physiological Behaviour* 152 (2015), 225–30.

¹⁰ P Chloupek, I Bedanova, J Chloupek and V Vecerek. Changes in selected biochemical indices resulting from various pre-sampling handling techniques in broilers. *Acta Veterinaria Scandinavica* 53 (2011), 1–7; VA de Lima, MC Ceballos, NG Gregory and MJP Da Costa. Effect of different catching practices during manual upright handling on broiler welfare and behavior. *Poultry Science* 98 (2019), 4282–9.

72. In a study published in 2018 and conducted under commercial conditions with a catching team of four people, the upright catching and carrying of broilers (half of which were a conventional type and the other half of which were a slower-growing hybrid) was found to lead to slightly fewer wing fractures and a more consistent loading density than lifting, inverting and carrying by 2 legs.¹¹ The methods compared were catching and carrying inverted by two legs and lifting and carrying upright with a hand placed under the abdomen. The number of birds to be carried at a time was unspecified, but when the upright method was used, two birds were typically caught and carried. Approximately four thousand birds were caught over two nights. Catchers perceived the upright method to be more tiring because it required a greater number of squats. However, in the same study, which was conducted in an open span shed in which containers could be placed close by, the upright carrying and loading of broilers was also found overall to be approximately 8% faster than lifting, inverting and carrying birds by two legs then placing them into the containers from this inverted position. This was due to the quicker loading time per bird when birds were carried upright to the container. In this situation, upright carrying reduces total loading time and the wait time for the birds caught and loaded first. From a welfare viewpoint, upright catching and carrying are likely to be preferable to catching by the legs and carrying inverted¹² providing that, in the situation in question, welfare gains are not offset by welfare harms resulting from increased catching, carrying, loading and waiting durations.

73. Holding a bird around its abdomen, which expands and contracts as a bird breathes, has the potential to reduce breathing capacity if not done with care.

74. Where a single bird is caught, carried and loaded at a time, it is easy to ensure that the stocking limit for a tray is reached but not exceeded.

75. In a broiler shed, increasing the size of a catching team is likely to reduce the time taken for a lorry to be loaded and despatched.

Evaluation of catching, lifting and carrying chickens and turkeys inverted by two legs

76. Because chickens and other birds do not possess a diaphragm to support their internal organs, inversion is likely to result in pressure due to the weight being placed on the heart and respiratory systems, especially of heavier birds.¹³ This may result in some combination of pain, discomfort and breathing difficulty. The likelihood and magnitude of these welfare harms will increase with bird weight and inversion duration. Carrying birds inverted by the legs is therefore likely to increase welfare harms relative to upright carrying.¹⁴

¹¹ KE Kittelsen, EG Granquist, AL Aunsmo, RO Moe and E Tolo. An evaluation of two different broiler catching methods. *Animals* 8 (2018), 141.

¹² Opinion of the Scientific Panel on Animal Health and Welfare on a request from the Commission related to the welfare of animals during transport. *The EFSA Journal* (2004) 44, 1–36.

¹³ L Jacobs and FAM Tuytens. Improving welfare in catching and transport of chickens. In *Understanding the Behaviour and Improving the Welfare of Chickens*. Cambridge: Burleigh Dodds Science Publishing, 2020, 417–57 (424–5).

¹⁴ EFSA Panel on Animal Health and Welfare, Welfare of domestic birds and rabbits transported in containers, 2022; R Bryan Jones. The nature of handling immediately prior to test affects tonic immobility fear reactions in laying hens and broilers. *Applied Animal Behaviour Science* 34 (1992), 247–54.

77. Pain may result from pressure on joints and physical trauma. Signs include fractures, dislocation and bruising, though it should be noted that pain may occur without associated detectable injury. Pain and injury risk are likely to be lower if body weight is supported by two legs than by one leg, because when the weight is supported by two legs, the maximum weight supported by a leg or joint is halved. Pressure on joints may also be the result of the poor loading of birds that have been carried inverted (see 115). Susceptibility to leg pain, fractures and other injuries is likely to be increased by the high levels of underlying joint pathologies in broilers and osteoporosis in laying hens.

78. Broilers have been found to exhibit a heightened stress response to inversion compared to upright carrying.¹⁵

79. Because of the difficulty of catching and carrying a bird by the legs, birds may become restless when this method is used, resulting in a higher injury risk.¹⁶

80. In 2022, approximately 14% of broiler chickens and 13% of end-of-lay chickens were stunned using the electric waterbath method, which requires inversion prior to stunning.¹⁷ Many of these birds are likely to have already been inverted at catching, lifting and carrying. For these birds, the stress and pain potentially resulting from inversion at stunning may be greater as a result of the cumulative effect of repeated inversion.

81. Improving dietary regimens by adding products to promote bone mineralization can increase bone strength by 25%.¹⁸ This is likely to reduce the risk and incidence of bone fractures and dislocations if birds are inverted at catching and/or carrying. However, AWC considers that this should not be done simply in order to protect birds from the adverse welfare consequences of high production expectations (including, in broilers, high slaughter weights) or carrying practices.

82. The incidence of keel bone fractures in chickens has been reported to be 36–97% in laying flocks and 15–39% in broilers.¹⁹ These fractures may result in increased pain and stress when birds are lifted and carried inverted.

83. Holding and carrying only one bird inverted in each hand has been shown to lead to greatly increased wing flapping compared with holding two or three birds inverted in each hand.²⁰

¹⁵ G Kannan and JA Mench. Influence of different handling methods and crating periods on plasma corticosterone concentrations in broilers. *British Poultry Science* 37 (1996), 21–31.

¹⁶ N Langkabel, MPO Baumann, A Feiler, A Sanguankiat and R Fries. Influence of two catching methods on the occurrence of lesions in broilers. *Poultry Science* 94 (2015), 1735–41.

¹⁷ The FSA Slaughter Sector Survey 2022.

¹⁸ SA Pirzado, MA Arain, C Huiyi, SA Fazlani, M Alagawany and L Gouhua, Effect of Azomite on growth performance, immune function and tibia breaking strength of broiler chickens during starter period. *Animal Biotechnology* (2021), 1914644.

¹⁹ AB Riber, TM Casey-Trott and S Herskin Mette, 'The influence of keel bone damage on welfare of laying hens', *Frontiers in Veterinary Science* 5 (2018), 3389.

²⁰ J Wessel, E Rauch, S Hartmannsgruber, M Erhard, P Schmidt, B Schade and H Louton. A comparison of two manual catching methods of broiler considering injuries and behavior. *Poultry*

84. When several birds are carried together by any method, optimal stocking within stocking limits is likely to be harder to achieve because of the difficulty of loading birds carried together into different trays.

85. When birds are inverted, the time that carrying takes has significant welfare implications. This is especially true for end-of-lay hens, in which carrying durations may be long. When caged sheds were designed and built, provision was not specifically made for modules to be brought into the shed. For an end-of-lay hen, the time period from catching to loading may therefore vary from between 5 seconds and 2 minutes, even though the total distance from the catching point to the loading point is typically a maximum of 50 metres. Factors in the physical environment determining this duration include the ease of removing a bird from a cage or perch, the tier level of the cage or perch and its height from the ground, passing down from a catcher at a higher level to a catcher at a lower level, whether a bird has been caught before or after others in the catcher's hands, the presence of other catchers in shed aisles and the waiting time for a module tray or crate to become available. Broiler sheds allow for modules to be placed within a few metres of where birds are located, which mean that birds are likely to be carried for only a few seconds before being placed into a tray.

Mechanized collectors and loading stations

86. Over the past ten years, collector designs have significantly developed. The number of birds that are mechanically collected in GB remains low (several tens of millions of birds) compared with the number collected by manual catching and carrying methods. Because usage in GB is mostly restricted to a single model, it has not been possible for AWC to undertake any direct comparison of the welfare outcomes associated with different models.

87. In mechanized collection, birds are not inverted but step or tip backwards onto the front edge of a moving belt as a result of the forward motion of the collecting machine and crowding due to other birds behind them. Birds may flap in order to maintain balance and, on regaining stability, typically sit on the conveyor.

88. Migration barriers or catching fences may be used to keep birds within the collecting area.

89. Large collectors are unsuited for use in older and smaller posted poultry barns (which represent c.50% of GB broiler accommodation) or in layer housing, because of the physical obstructions present. They are also costly. In Britain, their use is therefore currently limited to more recently built medium and large broiler sheds.

90. At present, assurance schemes do not specify requirements for mechanized collection or loading.

Design and operation of mechanized collectors and loading stations

Science 101 (2022), 102127; I Wolff, S Klein, E Rauch, M Erhard, J Mönch, S Härtle, P Schmidt and H Louton. Harvesting-induced stress in broilers: comparison of a manual and a mechanical harvesting method under field conditions. *Applied Animal Behaviour Science* 221 (2019), 104877.

91. The collector that is mostly used in GB, which may be transported on a trailer, has a wide rotating rubber belt that forms its front edge. The machine is wheeled into a poultry barn and opened to extend across some or all of the barn width. As the machine moves slowly forward, birds step onto it because of the presence of other birds crowded around them. The belt then carries them up to one of two transverse collecting belts at the top of the collecting surface. These move the birds towards a transfer belt at the centre of the machine. On reaching this belt, birds experience rapid transverse acceleration and may roll before regaining an upright posture. The transfer belt moves them at a faster speed to a conveyor chute. An operator directs this chute into the front part of module trays and birds drop (approximately 40cm) out of it into the trays. Machines of this type may be connected to a mechanized loading station, which weighs birds in the tray to measure stocking density. The full module is either wheeled, or lifted by a forklift truck, to the transport vehicle. Empty modules are brought to the machine by forklift. A large collector may gather over 10,000 birds per hour and requires several operators. Towards the end of the collecting process, an operator may need to encourage remaining birds to move to the front of the catcher.

92. An older design of large collector consists of a narrower collecting head comprising three rotating drums surrounded by rubber fingers that lift birds onto the conveyor. An operator sits or stands on the machine behind the collecting head to direct it around the barn.

93. Compact collectors may be used to collect birds, and have a driver seated on the collector to manoeuvre it around the barn. Once full, the machine is driven to an area clear of birds for the caught birds to be transferred on a small conveyor into trays. AWC believes that this is the only instance in which mechanically caught birds are also likely to be lifted by hand during the harvesting process. In this situation, birds are likely to be lifted out of the collector by either one hand or both hands directly into trays in modules standing very close by. Compact collectors may be used in a posted shed.

Evaluation of mechanized collectors and loading stations

94. The types of reported welfare incidents (see 57) likely to be due to mechanized collecting damage include fractured or bruised wings, wing tip haemorrhage and body bruising. While being raised onto the moving conveyor, or during travel along it, some individual birds may be rolled on the moving belt or rolled and/or thrown against the sides of the conveyor. During both collection and loading, there is potential for wings to become caught or trapped, or for the bird to flap, resulting in increased rates of wing damage compared with manual catching. In one study, the observed rates of wing hematoma were 7.19% for mechanically collected broilers versus 1.49% for broilers that were manually caught and loaded.²¹ However, in mechanized collection, levels of leg damage are typically lower than in manual catching, and levels of breast damage are typically much less.

95. AWC has not seen any evidence of mechanized collection being used for turkeys in GB.

²¹ J Mönch, E Rauch, S Hartmannsgruber, M Erhard, I Wolff, P Schmidt, AR Schug and H Louton. The welfare impacts of mechanical and manual broiler catching and of circumstances at loading under field conditions. *Poultry Science* 99 (2020), 5233–51.

96. Ducks are highly mobile and likely to walk away unless constrained. Because of the position of their legs relative to their body, they are unable to walk backwards. A duck that falls onto its back during the early part of a catching process is unable to right itself, and so would be unlikely to be able to step onto a machine and so may be injured.

97. AWC learned that one integrator has discontinued mechanized collection due to their concerns about reduced chicken carcass quality resulting from increased frequency of wingtip damage relative to manual catching. In the past, it may have been difficult for carcass scoring processes to distinguish wing injury sustained at catching and loading from similar injuries resulting from handling and inversion for electric water bath stunning at slaughter, or due to flapping as a result of pre-stun shocks. However, established red or purple bruising indicates an injury that occurred several hours earlier and so probably during catching or crating. Moreover, where gas stunning systems are used at slaughter and killing, which (excepting slaughter for halal and kosher consumption) is increasingly the norm²², it is more likely that wing injuries are the result of catching and loading. This is because gas stunning does not require the shackling of live birds.

98. Collectors operate most effectively when the litter substrate is flat. If it is of irregular depth, or with rises and falls or ridges, the risk of birds becoming trapped beneath the collector increases. Before catching begins, some preparation of the litter may be possible to minimize this risk.

99. If a collector is not maintained to a high level and carefully operated, welfare harms may result. In compact collectors, the ventilation of the bird holding area within the machine may be limited.

100. Collectors that are powered by diesel emit noise and fumes and are normally used in conjunction with a diesel-powered forklift. Both may overstimulate avian olfactory and gustatory systems and induce stress.²³

101. The effective cleaning and disinfection of collecting machinery, which includes many intricate parts that are difficult to access, is always likely to be difficult. In particular, *Salmonella infantis* is extremely difficult to remove from equipment.

102. By means of automated weighing, mechanized loading stations can be used to ensure that the legal maximum stocking weights for trays are not exceeded. However, where automated weighing and an automated tray feeding system are not in use, there is a potential risk of overstocking if the conveyor chute is not moved quickly enough to a new empty tray. If the conveyor chute is incorrectly positioned, there is also a risk of bird injury resulting from body parts knocking against the metal module frame or tray edge.

²² The FSA Slaughter Sector Survey 2022 suggests that the slaughter process for approximately 80% of broilers, 88% of spent hens and 98% of turkeys in England and Wales uses a gas or carbon dioxide stunning method.

²³ EFSA Panel on Animal Health and Welfare, Welfare of domestic birds and rabbits transported in containers, 2022.

103. Mechanized collection potentially reduces the physical demands on workers, with the human function shifting from physical catching and lifting to system monitoring, identifying birds unfit for transport and intervening where necessary to safeguard welfare. Mechanized collection may, if well managed, result in more consistent welfare outcomes, being less dependent on human variables such as care levels, fatigue and perceived time pressure.

Container systems

104. Poultry that have been caught and carried or collected are loaded into a tray or crate for transportation.

105. Farmed poultry are much smaller than the main species of farmed mammals. For transport to be efficient and cost effective they need to be loaded in tiers that make use of the three-dimensional space on a lorry. This increases the risk of heat and humidity accumulation and so the importance of heat and moisture dissipation to maintain an acceptable thermal environment for birds.

106. While in transit, birds are at risk of injury from slippage as the vehicle accelerates, decelerates or turns. A non-slip container base may reduce this risk. Other flooring parameters include grip, ease of cleaning and disinfecting, and ventilation. Providing good air quality and quantity and minimizing faeces leakage onto birds below are both legal requirements, but there may in practice be a welfare trade-off between making these provisions.

107. In GB, trays and crates are usually manufactured from plastic. This material allows effective containment with adequate ventilation through a mesh design. Plastic can be effectively cleaned and disinfected and is physically robust. If a tray or crate is at or below human eye height, it allows visual inspection and checking of birds and their behaviour (e.g., panting, huddling, accumulation of dirt, entrapment, lying on back). Plastic does not itself become very hot or very cold as a result of changes in ambient temperature.

108. Bedding is not provided in trays or crates because it would be likely to block apertures and thus impede air movement, retain moisture, reduce air quality and increase temperature in warm weather.

109. The number of chickens placed in each tray or crate is set by the processor to satisfy transport stocking rate requirements and is governed by minimum legal requirements (see 19). The stocking rate used on an individual vehicle must be communicated to the producer and catching team leader and needs to take account of forecast ambient temperature and humidity (wet bulb temperature).

110. In a prevalence analysis of FSA 2018–21 referrals data, overstocking was the most frequent reason for referrals. Overstocking identified at slaughterhouses is referred by the FSA to the APHA.

111. In the same prevalence analysis, head entrapment was the second most frequent reason for referrals and wing entrapment was the third most frequent reason. Almost one half of the head entrapments resulted in the death of the bird by the time

of unloading. To reduce the risk of bird entrapment and to prevent the escape of birds in trays already loaded, trays should be inserted into modules in an order appropriate to the system (e.g., top–bottom or bottom–top).

Modular systems

112. In GB, most pullet, broiler and egg producers use modules to catch and transport chickens. These are galvanized stainless steel or other metal frames into which perforated open-topped plastic trays are slotted like drawers. They allow an integrated approach to catching, loading, transport, slaughter/killing and processing. After each tray has been filled by birds being lifted into it, and inserted into the module, the whole module is loaded onto a poultry transport vehicle by a demountable forklift truck. Other modules are similarly filled and loaded until the vehicle is full. When the vehicle reaches the slaughterhouse, the modules may be mechanically unloaded onto a gas (controlled atmosphere system) conveyor slaughter/killing line. The same trays may also be used to deliver birds to electrical waterbath systems, including by a mechanized conveyor. Once broiler chickens have been stunned and killed, the open trays allow them to be either unloaded from the module or tipped from the module onto a belt system for shackling onto the processing line.

113. A modular system is efficient to transport and can be cleaned and disinfected in an automated system in the slaughterhouse once the birds have been removed from it. Modules are not designed to optimize airflow through the module or minimize the dropping of faeces onto birds in drawers below. Differently sized modular systems are available for chickens, turkeys and ducks. The dimensions of module trays vary, with the headroom provided being particularly important. This is the sum of the tray height and the height of the gap between the top of one tray and the base of the tray above it in the module. As well as allowing a comfortable sitting posture, sufficient headroom aids the ventilation and cooling of loaded trays and may reduce the incidence of head entrapment.

114. In systems that provide insufficient headroom, and in 'back-to-back' systems, in which one tray closes against another tray behind it, entrapment risk is increased.

115. In five-tray systems, the top tray may be too high for catchers to reach without welfare being compromised by birds being swung, or even thrown, into the tray. Such a movement is likely to subject a bird to a considerable rotational force. Birds may then have to be pushed to the rear of the tray to allow it to be filled. Providing two loaders, including one to close the trays, may reduce trapping incidents.

116. In some modular systems, doors that open at the sides allow individual birds that have been injured or have become sick to be removed. This would in practice be very difficult for birds at higher levels in a lorry, or stacked in a lairage, as a ladder or small hydraulic platform would be required. However, in other systems it is very difficult to remove such birds without the risk of many others escaping. The ability to remove injured birds is a legal requirement (see 15). Although random checks are made at the slaughterhouse while the birds are in lairage, only the lower crates are likely to be fully visible.

Loose crate systems

117. Loose crate systems, including those with a single folding lid, two lids or four lids, consist of crates that are not held in a module but are stacked and often strapped on top of each other. These systems are still used by some smaller producers for laying hens and in some locations for meat birds. The crates are generally smaller than module trays.

118. In order to protect bird welfare, loose crates need to be used carefully and be well maintained. Crate lids and hinges are potentially difficult to clean and disinfect.

119. Crate designs are generally not compatible with integrated gas stunning and killing systems, in which, at the slaughterhouse, trays are loaded directly into the stunning/killing system. Within broiler production, their use is therefore mainly limited to smaller scale slaughter, which is for birds for suppliers to the halal market and to the much smaller kosher market. The FSA slaughter survey indicates that, in 2022, this represented 16% of total production.

Evaluation of container systems

120. Containers can be associated with welfare problems. In modular systems, there is a risk of serious bird injury and potentially death due to heads and wings becoming trapped between the plastic tray and metal module frame as the tray is pushed in. The types of incidents reported (see 57) that are likely to be due to loading damage include decapitations, trapped heads, trapped wings, broken or fractured wings, trapped feet and toes, dislocations and soft tissue damage to joints.

121. Trays and crates are vulnerable to deformation or breakage by rough manual handling and forklift trucks. Any damage is likely to increase bird entrapment risk due to requiring a catcher or loader to exert greater pressure when closing a drawer or flap and to increasing the size of some gaps in the tray or crate framework such that birds are able to push their heads, feet or wings through them.

122. Compared with modular systems, some crates with closing plastic lids may present a reduced entrapment risk, but also potentially increase the risk of wing injury because birds are introduced through an aperture of restricted size. When stacked, loose crates can become unstable.

123. Modular tray systems are likely to provide sufficient headroom for a smaller broiler chicken that is recumbent or seated to raise its head to a normal height. Commercially available modular systems allow 23–25.5 cm height for broilers and laying hens and 31–42 cm height for turkeys. However, laying hens, heavier broilers and turkeys are likely to require a greater height to sit comfortably than these ranges allow. The European Food Safety Agency has recently recommended minimum headroom of 25 cm for laying hens and for broilers heavier than 3.4 kg, 40 cm for turkeys weighing 11–13 kg and 45 cm for turkeys weighing 14–19 kg.²⁴

²⁴ EFSA Panel on Animal Health and Welfare, Welfare of domestic birds and rabbits transported in containers, 2022, 51. The meat from turkeys slaughtered at these weights is mainly used in composite food products.

124. It can be difficult to maintain a loaded tray or a stacked crate at a temperature at which bird welfare is protected. A broiler of 2 kg liveweight produces 10–15 watts of heat and approximately 2 mg of water per kg of body weight per second. 6–6,500 loaded broilers therefore produce over 60kW of heat. If moved overnight, broilers might benefit from lower ambient temperatures, but these are uncertain and slaughterhouses require birds to be delivered throughout their operational hours.

125. Genetic selection has apparently disrupted and reduced the thermoregulatory capacity of fast-growing broiler breeds.²⁵ Turkeys have greater resilience to temperature and humidity changes than chickens and are better able to thermoregulate but increased selective breeding may be reducing this.²⁶⁸²

126. Video recordings have shown that, when container temperatures rise, dominant birds stretch to reach the top and push away the other birds, occasionally onto their sides, and then stand on them.

127. In hot weather, the stocking densities of containers will need to be reduced. In hot and tropical countries, mobile fans are often positioned around the lorry to cool the birds loaded first while the vehicle is filled. Alternatively, the loading area may include large fans permanently fixed in position.

128. Although transportation lies outside the scope of this Opinion, it cannot be separated from container design and loading issues. When a transport vehicle is in motion, due to the air pressure differential between the front and the rear, air enters the back of the vehicle and leaves through the front. This means that, in hot weather, the birds at the front of the vehicle are likely to experience higher levels of heat and humidity and potentially mortality resulting from hyperthermia (heat stress), while in cold weather, the birds at the back of the vehicle will be vulnerable to hypothermia (cold stress) resulting from cold and wet and are at risk of mortality from these. The use of curtains in cold weather, or backboards on newer vehicles, may reduce this risk.

129. Retrofitted temperature monitoring may prove difficult and the temperature may in practice greatly vary between different parts of the vehicle in which birds are waiting or being transported. The reliable monitoring of temperature and relative humidity on existing poultry transport vehicles, particularly in those ambient conditions that could lead to hyperthermic stress, is presently limited by the lack of availability of suitable waterproof and cleanable relative humidity sensors.

130. AWC is aware that climate-controlled transport vehicles are in use in a small number of countries. In one design, conditioned air is pumped through ducts at the base of the vehicle and rises up through the space in which birds are loaded. This is in addition to air entering the vehicle via the perforations around the base of its sides. Airflow is further assisted by tray design, which results in diamond-shaped gaps between loaded trays as viewed from the side. Sensors at roof level monitor and

²⁵ DA Sandercock, RR Hunter, MA Mitchell and PM Hocking. Thermoregulatory capacity and muscle membrane integrity are compromised in broilers compared with layers at the same age or body weight. *British Poultry Science* 47 (2006), 322–9.

²⁶ LJ Mills, MA Mitchell and M Mahon. Comparison of thermoregulatory ability in fast and slow growing strains of turkey during acute heat stress. *British Poultry Science* 40 (S1) (1999), 51–2.

control temperature. However, climate control can only be operated once the loading of a transport vehicle is complete.

131. Some vehicles used in other countries are also able to deliver drinking water. A duct containing pipes runs along the underside of the lorry roof on each side. Water is supplied through flexible pipes attached to a vertical nipple system that is clipped to the side of each stack of trays. The ability to supply drinking water to loaded birds is likely to reduce greatly the likely water withdrawal duration and so lessen the need for rapid catching. However, to allow birds to move to access the nipple points, greater headroom is required, which is likely to contribute to greater bird movement and heightened agitation during transportation. Increased volumes of faeces are likely to run from birds loaded at higher levels onto birds loaded at lower levels than when birds are loaded without drinking water access. Attaching the flexible pipes and nipple system requires workers to stand on the side of the open vehicle and so is likely to be difficult to achieve in conformity with health and safety requirements.

Ethical analysis

132. Because they are relatively small and are farmed in huge numbers (see 32), poultry, especially chickens, are more likely than any farmed mammal species to be viewed at the group level. This increases the likelihood that welfare harms to individuals are given insufficient consideration when farming systems are being developed, maintained and promoted.

133. At catching, carrying, collecting and loading, birds are exposed to welfare risks (e.g., injury, sudden large changes in temperature). In order to be ethically acceptable, these risks should be no greater than necessary for the socially accepted purpose of harvesting birds for slaughter or killing and should not be extreme.

134. Harms caused to birds that are not being handled (e.g., fear, feed and drink withdrawal at thinning, risk of suffocation due to crowding) also need to be considered and minimized. Some harms will be short-term but others (e.g., injury) may negatively affect welfare, including for the remainder of a bird's life.

135. Harms should be objectively quantified using scientific evidence where this is available. They should be assessed using harm–benefit analysis, in which, to be justifiable, any necessary non-extreme harms caused to animals need to be outweighed by benefits to human society such as food availability, employment opportunities and export income.

136. The welfare of each individual bird should be given equally high consideration regardless of the production method and its life stage or economic value. In particular, the welfare of end-of-lay birds, which may be at risk of injury due to poor physical condition as the result of a productive life, should be respected.

137. Due to the construction of feeder and watering systems in broiler and pullet barns, at thinning, feed and water are typically withdrawn from all birds, including those that will remain. After thinning has been completed, they are returned to the birds that remain. This welfare harm serves no purpose for the birds that are not thinned.

Conclusions

138. AWC wishes to see the welfare harms to poultry resulting from catching, carrying and loading minimized. Handling by any method induces some stress in poultry, and this has been found to be greater when a bird is inverted. Inversion is also likely to lead to pressure on joints, which will induce pain and may lead to injury. It is also likely to result in pressure on the heart and respiratory systems, which may induce pain, distress and breathing difficulty.

139. Catching, carrying and loading need to be considered as part of a whole life welfare perspective. Through their lifespan, which for some broiler chickens may be less than five weeks, poultry may experience stress and pain and be subject to the risk of disease, injury or death from sources including housing, conspecifics, wild animals, transport and handling prior to stunning. Depending on the system in which they are kept, they may also experience restrictions on their ability to express normal behaviour. The stress, pain and injury risk to which birds are exposed at catching, carrying and loading need to be considered as part of a whole-life approach to welfare. In terms of the total life experience of birds, catching, carrying and loading are usually part of the end-of-life stage when the bird is transported to slaughter and are of short duration relative to total lifespan.

140. Most animals farmed on land are chickens. In practice, AWC recognizes that, in the short-term, the systems and practices in use are associated with constraints that need to be considered and included in an overall harm–benefit analysis of the production and use of meat chickens and eggs. These include the design of existing containers and the integrated systems of which they are part, the design of accommodation for laying hens, the financial viability of poultry and egg businesses, the social acceptance of the rearing of poultry for meat and eggs and the maintenance of the national food supply.

141. AWC recognizes that efforts have been made to improve poultry catching, carrying and loading practices over the past decade. However, it considers that these continue to present significant welfare harms to birds and that there is a wide inherited tolerance in the broiler and egg industries of methods that contravene legislation and do not meet expectations laid out in Codes of Practice and Guidance. Because the vast majority of livestock farmed in GB are chickens, this means that a significant proportion of all farmed animals and birds are subject to such methods. The catching and inverted carrying of chickens by one leg, which AWC believes to be a very common catching and carrying method currently used in GB, is one of these.

142. Another area of non-compliance, which AWC believes also presents significant welfare risks, is the design of containers and modules. These do not reliably: avoid bird injury and suffering; protect birds from inclement weather or extreme temperatures; maintain appropriate air quality; provide access to all loaded birds to allow them to be inspected and, if necessary, removed; present a flooring surface that minimizes the leakage of faeces; or provide sufficient lighting for bird inspection and care during transport. Each of these is a legal requirement.

143. Because of the integrated nature of broiler and egg production, isolated changes to individual elements of production processes are likely to be difficult. This

is especially true of modular tray systems, which are designed with the principal objective of meeting stunning, slaughter, killing and processing requirements. These systems expose birds to significant risk of serious injury and potentially to extreme cold when at the rear of a vehicle in motion in a low ambient temperature. In order to address welfare issues fully, a co-ordinated shift in process and design will be necessary to take poultry production to a more acceptable level of animal welfare. This will encompass all life stages and elements and eliminate the problem of improvements in one area (e.g., gas stunning and killing systems replacing the use of electric waterbaths) having unintended negative impacts in another area (e.g., entrapment in trays that have to be used in gas systems).

144. Because of the multiple variables to consider in any specific catching, carrying and loading situation, AWC is unable to specify a single method that will deliver higher bird welfare in every circumstance. As described in this Opinion, the method that is likely to deliver higher welfare for an individual chicken will depend on factors related to the bird, its accommodation and the weather that include: flock type (broiler or layer), breed, flock age, the body conformation of the individual bird, the physical strength of the legs of the individual bird, shed construction, shed furnishings, shed layout, catching personnel, ambient outdoor temperature and outdoor humidity.

Recommendations

Manual catching and carrying

145. It is preferable for all poultry to be caught, lifted, carried and loaded upright by the body.

146. The retained Council Regulation 1/2005, Annex I, chapter 3, section 1.8 (d), should be amended so that, for a period of five years, it is legally permitted to lift chickens, and turkeys weighing less than 10 kg, by two legs. Before the end of this period, this permission should be subject to review against the available scientific evidence. While acknowledging this to be a welfare compromise, AWC considers that a reasonable time period is needed to allow data on the relationship between carrying methods and welfare outcomes to be gathered and analysed (see 174–178) and for different methods to be examined and trialled.

147. Every effort should be made to minimize the duration for which chickens, or turkeys weighing less than 10 kg, are inverted.

148. It should remain illegal for poultry to be lifted or carried by one leg.

149. Ducks should always be carried individually, and, in line with current legislation, must never be caught, lifted or carried by the leg(s). Ducks should never be inverted out of water.

150. Ducks may be lifted by the neck directly into a tray or crate, or for upright carrying, but should never be carried by the neck.

151. In broiler sheds as currently designed, the practice of removing a portion of broiler birds from a shed (known as thinning) should be avoided, to avoid withholding of feed / water or general stressor effects on remaining birds.

152. When poultry are manually caught, lifted and carried, modules or crates should be brought as close as possible to the birds in order to reduce the distance that they are carried.

153. A designated person should have oversight of the opening and closing of trays as birds are loaded into modules. Before the full module is taken to the transport vehicle, the same person should check all trays in the module for trapped body parts. At the end of loading, this person should be required to indicate, in a catching action plan, that the task has been completed with legal requirements met and bird welfare protected. This plan should be retained on farm and be available for inspection by the local authority or the APHA.

154. All new catchers should be directly supervised, and, prior to starting work, should receive in-person practical training, including in an upright carrying method.

155. Industry should develop a certificate of competence that covers catching, carrying and loading.

156. Poultry catchers should be permitted and expected to take breaks before their physical and/or mental fatigue results in reduced welfare outcomes for birds.

Mechanized collection

157. Ducks should not be collected using the mechanized equipment that is currently available.

158. Assurance schemes that permit the mechanized collection of broilers but do not currently specify standards for this should do so.

159. Industry should undertake and disseminate research into the welfare outcomes associated with mechanized collection, including by collating and analysing existing data.

Housing

160. In future broiler shed design, systems should be considered that allow feed and water to be withdrawn from only those birds in a flock that are to be caught.

161. In order to reduce bird carrying duration, all new sheds for broilers and hens that lay eggs should be designed, constructed and furnished so that poultry trays and modules may be moved into the shed, loaded there and taken out to the transport vehicle.

162. Where possible, in order to reduce bird carrying duration, the furnishing of existing sheds for broilers and hens that lay eggs should be adapted so that poultry

trays and modules may be moved into the shed, loaded there and taken out to the transport vehicle.

163. Those responsible for carrying and loading poultry should, whenever necessary, protect them from the adverse welfare impacts of inclement weather (e.g., falling or blown rain or snow, direct sunlight).

Container systems

164. The trays and crates into which birds are loaded should be dry.

165. For modular poultry systems, a maximum permitted height for the upper drawer (distance from the ground during catching) should be specified, so that birds may be lifted into this drawer with the risk of injury reduced.

166. In poultry slaughterhouses, all trays and crates should be carefully inspected for damage after every use in a well-lit area and any broken trays and crates should be immediately taken out of usage and either repaired or replaced.

167. In order to accommodate laying hens, larger broilers and turkeys, it should be a legal requirement that a poultry container must provide an amount of head space such that, when a bird is seated in a natural position, its comb or head does not touch the bottom of the tray above but the bird is not able to stand. The minimum required headroom should be specified by poultry type and weight.

168. In view of climate change, industry should initiate and fund further research into the design of poultry containers that allow airflow, temperature and humidity to be controlled and optimized while a vehicle is stationary and in motion in different weather conditions.

169. Governments should consider defining in legislation the minimum and maximum ambient outdoor temperatures in which poultry may be caught, carried, collected and loaded.

Reporting and enforcement

Prompt communication and feedback between all stakeholders about concerns or identified breaches of regulation is necessary to protect welfare.

170. Every local authority with poultry or egg producers within its boundaries should include compliance with legal requirements relating to poultry catching, carrying, collecting and loading in its animal welfare enforcement plan.

171. Poultry farmers, catching companies and integrators should be legally required to make information about their catching schedules available to local authorities at their request.

172. Local authorities should follow up with farmers, catching companies and integrators, as appropriate, welfare breaches related to poultry catching, carrying, collecting and loading that are notified to them by the APHA.

173. In order to aid enforcement of the legal requirements relating to poultry catching, carrying, collecting and loading, local authorities should actively and swiftly share information about potential welfare breaches that are identified in one local authority area (e.g., slaughterhouse location) but have potentially been committed in a different local authority area (e.g., farm location).

174. In order to facilitate future evidence-based policy making, the FSA should consider replacing the current paper system for the recording of the number of poultry birds culled on farm as a result of catching, carrying, collecting and loading processes with a digital system that requires the reasons for culls to be recorded.

175. The APHA should amend the animal transport certificate so that, for poultry, there is a space in which the catching and carrying or collecting method used must be recorded.

176. The FSA should make provision within its online portal for welfare breach reporting for Official Veterinarians working in slaughterhouses to record the catching and carrying or collecting method given on the animal transport certificate for poultry.

177. The FSA should ensure that Official Veterinarians working in poultry slaughterhouses always provide full information about welfare breaches related to poultry catching, carrying, collecting and loading that are categorized at level 4.

178. The FSA should monitor patterns in welfare breaches that are associated with different poultry catching, carrying, collecting and loading methods and initiate appropriate strategic action where needed.

Welfare Codes (England and Wales) and Guidance (Scotland)

179. Governments should update the Codes of Recommendations for Livestock: Ducks (1987).

180. Governments should update the Codes of Recommendations for Livestock: Turkeys (1987) to reflect recommendations made in this Opinion.

181. Governments should update the Code of Practice for the Welfare of Meat Chickens and Meat Breeding Chickens (England 2018, Wales 2020) and Guidance for Scotland (2019) to reflect recommendations made in this Opinion.

182. Governments should update the Code of Practice for the Welfare of Laying Hens and Pullets (England 2018, Wales 2020) and Guidance for Scotland (2019) to reflect recommendations made in this Opinion.

Glossary

barn: a large shed without cages for housing poultry

breeder: a bird raised primarily to produce chicks

broiler: a chicken raised primarily for meat production

carrying: the moving of a bird by human hands

catching: the act of bringing a bird that is moving, or able to move, under direct physical control by human means

chicken: any bird of the species *Gallus gallus domesticus*

cloaca: the chamber in birds where the digestive, urinary and reproductive tracts end and waste is collected for expulsion from the body

collection: the moving of birds by mechanical means from their shed to the point of loading

comb: the fleshy red growth on top of a chicken's head

container: a tray, drawer or crate into which birds are placed for transportation

culling: the killing of injured birds removed from the flock

depopulation: the planned removal of an entire flock of birds from a shed or site for killing for public health, animal health, animal welfare or environmental reasons

dolly: a low cart with wheels on which trays or crates may be placed and moved

enriched: a cage for laying hens that meets the requirements of WoFAR, Schedule 4

femur: the upper leg bone connected the hip to the knee

harvesting: the catching, moving and loading of birds on farm for transportation to the point of slaughter or killing

hematoma: a bad bruise that causes blood to collect beneath the skin

hen: a female chicken, turkey or duck

hock: the knee joint

integrator: a poultry enterprise that is involved at all production stages from breeding to slaughter or killing.

killing: any intentional process that causes death

layer: a chicken bred primarily to produce eggs for human consumption

loading: the placing of a bird into a tray, drawer or crate

mechanized: occurring by mechanical rather than manual means (sometimes also known as automated)

module: a metal frame into which multiple trays or drawers are inserted

peroneus longus: a lower limb muscle

poult: a young turkey

pullet: a female chicken under one year of age

shank: the bottom part of a bird's leg

shed: accommodation for poultry

slaughter: killing for human consumption

stag: a male turkey

thinning: the removal of a proportion of broilers from a shed for slaughter

tibia: the lower leg bone connecting the knee to the foot

tray: a wide and shallow open container for poultry that, when inserted into a module, functions as a drawer

Appendix 1: AWC Membership

Professor Madeleine Campbell – Chair

* Dr Jane Downes

* Dr Troy Gibson

* Dr Dorothy McKeegan

Dr Romain Pizzi

Dr Pen Rashbass

* Professor Sarah Wolfensohn

Dr James Yeates

Dr Gareth Arnott

Ms Emily Craven

Professor Simon Girling

Dr Julian Kupfer

Stephen Lister

Dr Julia Wrathall

*^ Peter Jinman (Chair to December 2022)

*^ Dr Andy Butterworth

*^ Dr David Grumett

*^ Richard Jennison

*^ Richard Kempsey

* = member of the Working Group for this Opinion

^ = AWC member until December 2022 and co-opted to the Working Group for the remainder of the project

Note: One member of AWC did not feel able to support all of the Recommendations in this Opinion

Acknowledgment: AWC Secretariat

Appendix 2: Those who gave evidence and assistance

Animal Advocacy Project

Animal Equality

Avara

British Egg Industry Council

British Free Range Egg Association

British Poultry Council

Compassion in World Farming

Eyes on Animals

Food Standards Agency

Humane Slaughter Association

Humane Society UK

Keyo Agricultural Services Ltd

Livetec Systems

Prof Malcolm Mitchell, Scotland's Rural College

Slate Hall Veterinary Services

The Humane League

Dr Claire Weeks, School of Veterinary Sciences, University of Bristol