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OVERVIEW OF GOOD AND BEST PRACTICES

POULTRY



ANIMAL TRANSPORT GUIDES

Report submitted by the Transport Guides consortium,
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Executive Summary

The objective of this report is to provide an overview from the 'grey' and scientific literature of good and best practices for animal welfare during transport. For the purpose of this report we define Good practices as procedures and processes that ensure compliance with requirements of legislation or regulations designed to protect the animals' welfare. Best Practices are defined as providing additional guidance on how procedures and operations can be improved to exceed any legally defined minimum welfare requirements. The report presents an analyses of the collected information for each of five species: cattle, horses, pigs, sheep and poultry. Each species chapter (or 'sub-report') comprises of an analyses of the practices identified, followed by an overview of all available practices presented in tabulated form. Both the analytical text and overview tables are structured according to the relevant chapters and articles in the Regulation. The report concludes with a presentation on two specific areas of interest: the costs associated with fitness-to-travel decisions, and a brief state of the art section on satellite navigation systems. A list of the references that were identified can be found at the end of the report. The findings in the report will be used to develop Guides to Good and Best Practices in the next steps of the project.

What the data on all species have in common is that the majority of recommendations is freely available online, and directly accessible to a large international audience. However, there is hardly any information on the level of impact each of the recommendations or publications has.

The available guidelines relating to means of transport are often generic, and apply to all species. There is general consensus in terms of vehicle design, particularly in relation to ventilation, but there is a lack of detailed information on how to operate these systems (perhaps with the exception of pig transport vehicles). Another aspect which is rarely described in all species is the design and use of drinkers on board vehicles for long journeys.

There is not a lot of information available on good and best practices regarding emergency situations and driving skills. There is also a lack of specific advice on long

journeys and the associated rest stops. Only limited recommendations are available on documentation to be carried on board, and on contingency plans.

Chickens

There are at least 50 different information sources that deal with poultry transport and refer to good practices. They provide different points of view depending on the background of the authors. Supporting materials for professional use (e.g. figures, action lists and illustrations) are generally missing.

Regarding fitness for transport there are few recommendations. They relate to aspects such as definitions, inspection criteria and transport of wet birds. No information was found on the fitness of day old chicks for transport, or actions to be taken when confronted with unfit birds.

The recommendations regarding transport conditions focus on crate dimensions and other crate aspects. Advice on aspects of ventilation during transport is limited and does not provide more details than the Regulation itself.

There are many documents that deal with aspects of loading poultry. Adaptations to weather conditions are recommended, but specific advice is missing. In contrast, there is a lot of information on the correct way to unload poultry transport vehicles, with considerable attention to climatic circumstances. Information is missing regarding the handling of day old chicks or pullets when unloading at a rearing farm.

There are several documents on the proper handling of birds during loading, but the recommended practices differ regarding the most appropriate way to carry animals and the number of animals to carry at one time. Information is missing on the handling of day old chicks.

Most of the references on feeding and watering in connection with journey time, are strictly compliant with the regulation. Advice on fasting differs between documents, but is relatively consistent. Information on how to feed and water poultry during transport is missing.

Recommendations regarding the optimal temperature range differ slightly between documents. Information is missing concerning the humidity conditions in the vehicle and especially the link between humidity, temperature and space allowance.

Regarding journey duration, the references identified advise journey times shorter the maximum durations specified in the Regulations. They also indicate that journey times should include all steps, not only the transport phase. Resting period

recommendations differ between references, and detailed information on how to treat animals during a resting period is lacking.

Economic aspects of fitness to travel

Transport of unfit animals must be discouraged. To reduce the incidence of unfit animals being transported it is important that they can be identified before loading on to the vehicle. It is essential to have alternative management options to deal with these animals. There is still a lack of guidelines for determination of fitness for travel for sheep and poultry.

If unfit cull animals can be treated medically, the benefit/cost ratio can be positive. Euthanasia and emergency killing do not provide financial benefits, but only generate costs, which are partly mitigated by subsidies. Non-compliance creates short term benefits, if the chance of getting caught is low, but will compromise the profitability of farmers and transport companies if enforcement is sufficiently high.

Satellite navigation systems

Regulation EC 1/2005 requires satellite navigation systems (SNS) to monitor travel and resting times. Suitable systems have been described in the literature, but there is no evidence of a systematic use by competent authorities nor transport organizers of these systems.

POULTRY

1. Poultry: Key points of interest

This section refers to the tables in paragraph 5.2, and presents an analysis with key points of interest regarding the references themselves, as well as the various aspects of the legislation. These are discussed below.

References

1. We identified over 50 documents with recommendations regarding the transport of poultry, from which we studied 45 documents for their relevance in terms of good and best practices.
2. The references included the following types of poultry: day old chicks, pullets, spent hens, broilers and turkeys.
3. All references refer to road transport.
4. Most of the documents, especially guides, deal with good practices, while some scientific papers and NGOs' guides suggest some best practices. We could not determine if non-European guides (4 documents) are compliant with their respective regulations or go further.
5. Within the 50 documents identified, 15 documents are scientific references, 6 documents are in the form of guides produced by the private sector, 1 is a training document, 6 are guides developed by NGOs and the remaining were other types of documents.
6. Almost all documents studied were texts without drawings or pictures. The target audience are professionals involved in poultry transport from the farm to the slaughterhouse.

CONCLUSIONS: Several documents deal with poultry transport and refer to good practices. The diversity of sources gives different points of view (NGO, professional, scientific). The supporting materials for professional use, such as figures, action lists and illustrations are missing.

Fitness to travel

7. One document specifically focusses on the assessment of fitness for transport of poultry (ref 015), while 9 publications refer to aspects of fitness (in which all agree that birds to be transported have to be fit).
8. Two guides give a definition of unfitness: broken bones (ref 063), lameness, weakness, ill or injured birds (ref 015).
9. According to one guide, when unfit birds are identified they should be euthanized before arrival of the catching crew (ref 013). The method of euthanasia is not mentioned.
10. Fitness to travel should be assessed by the farmer together with the catching crew (ref 013), with a veterinary validation (ref 123) and in good lighting conditions (ref 007).
11. Special provisions applied to the transport of wet birds: dry bedding should be provided before loading (ref 007). If the temperature is below 8°C, these birds should not be transported (ref 063). Otherwise, they should not be loaded close to air inlets (ref 063).
12. Two guides take chicks into account. The only recommendation is that chicks should be transported as soon as possible after hatching (refs 088 and 134)

CONCLUSIONS: There are only a few documents addressing fitness to transport poultry. The sources we identified provide recommendations related to aspects such as definitions, inspection criteria and transport of wet birds. No information was found on the fitness of day old chicks for transport. No information was found on practical actions to be taken when confronted with unfit birds.

Means of transport

13. Three documents (refs 013, 088 and 091) recommend that vehicles should be adapted to poultry transport in order to prevent birds from escaping, to avoid injuries and also to protect the birds against adverse climate conditions. They recommend that vehicles should be clean, and a procedure should be set up and followed to check the vehicle and relevant documentation before the journey starts (ref 088).
14. Three guides suggest that the vehicle should be ventilated (refs 024, 063 and 064).

15. Six documents mention the size of the crates, and three of these recommend that the opening should be sufficiently wide (refs 134, 107 and 028), while one specifies the size of this opening (ref 007) to be not less than 20 cm wide and 22 cm high. One document (ref 024) recommends a minimum size of the crate as 20 cm wide x 25 cm high.
16. Eight documents refer to other crate qualities. Of these, seven agree that injury and escape prevention are important aspects (refs 013, 088, 134, 024, 133, 028 and 041). Ref 041 recommends not using wire bottomed cages. Three documents advise the use of solid crates (refs 013, 088 and 134). Ref 120 recommends a non-slip surface inside the cage.
17. Four guides recommend inspecting the load during transport. Two of these specify the appropriate timing: one recommends the inspection after 2 h (ref 088) the other after 30 min (ref 007). The two other documents focus on the conditions during inspection, and recommend good light and adequate tools (ref 133) to access to the animals (ref 091).

CONCLUSIONS: The recommendations regarding the transport conditions focus on aspects related to crate dimensions and other crate aspects. Advice on aspects of ventilation during transport is limited and does not provide more details than the regulation.

Loading

18. Three guides (refs 107, 149 and 007) point out the necessity to plan catching in advance to allow adequate time for birds to be handled quietly and quickly. Ref 134 recommends larger catching crews to reduce catching time.
19. Ten documents mention that good catching conditions require appropriate lighting conditions. They all agree on reduced light intensity compared to day light, and one specifies this should be less than 15 lux (ref 134).
20. Three documents recommend that one person is responsible for handling and loading procedures (refs 013, 008 and 146). One of these references (ref 013), recommends that the farmer is present during loading, or at least contactable.
21. Ten documents recommend good access conditions for the vehicle, with a dedicated zone for manoeuvring (ref 107), allowing containers to be brought close

in order to reduce catching time (ref 134) and the presence of a security protocol specific to the site (ref 091).

22. In order to improve the catching process and the birds' welfare, three guides (refs 007, 146 and 149) advise moving animals in small groups towards the vehicle. In the case of partial depopulation, the birds that stay at the farm should be protected against dust and noise by partitions (e.g. curtains), which may also help to control the thermal environment (ref 149).
23. One guide (ref 013) warns that escaped birds should be caught before vehicle's departure.
24. Loading conditions need to be adapted to weather conditions, according to two documents. In case of high temperatures, the space allowances should be greater than during low temperatures, and the vehicle should be driven between two loading phases (ref 107) to keep air circulation among animals. In the case of low temperatures, containers should be covered on top and at the sides (ref 108).
25. Two documents (refs 088 and 091) refer to young chicks. They recommend that in the case of normal space allowance (more than 21 cm² per chick), the vehicle should be preheated (20-25°C). In the case of low space allowance (21 cm² per chick), the vehicle should not be preheated.
26. Two documents refer to the management of crates during loading. They recommend that to avoid injuries, crates must be well secured so they will not move or fall (ref 134) and the top side of the crate should be clearly marked (ref 021).

CONCLUSIONS: There are many documents that deal with aspects of loading poultry. Most aspects (vehicle, containers, responsibilities, planning, and light levels) are addressed. Adaptations to weather conditions are recommended, but specific advice is missing.

Unloading

27. Three documents (refs 013, 028 and 133) specify that the birds have to be checked on arrival, and one (ref 133) provides advice on actions to be taken in case of poor welfare: giving priority on arrival at injured or wet birds, by separating them from others and drive them first to the slaughterhouse. Moreover, special care is required for severely injured birds that should be killed as soon as they

arrive to destination. For vehicles arriving with a high DOA%, the dead birds should be immediately taken away and all remaining birds should be slaughtered as soon as possible.

28. Two documents provide specific recommendations regarding chicks (ref 088 and 091): chicks and litter samples have to be systematically tested. Ref 091 explains a sampling procedure in detail.
29. Three documents refer to information to be provided on delivery at the slaughterhouse. The transporter has to inform the slaughterhouse personnel about transport conditions (ref 013). Also, all the required documents have to be completed (refs 091 and 028).
30. One reference mentions that the delivery of chicks should be done in time and loading should be conform to what has been planned (ref 091).
31. Six references agree in reducing waiting time to a minimum, both before unloading (chicks: refs 088, 133 and 007; broilers, turkeys and spent hens: ref 012) and between unloading and slaughtering (ref 119). Ref 012 states that birds should not be kept in a stationary (parked) vehicle more than 2 hours and ref 028 proposes watering and feeding birds soon after unloading, except if they are to be slaughtered quickly.
32. According to 6 guides, special attention is needed to climate conditions during unloading. Quick unloading of chicks prevents the birds getting chilled (refs 088, 133 and 007). For birds, the unloading facilities should be adapted to include a covered unloading platform, mechanical ventilation, heating or a cooling system (refs 107, 133, 119 and 012). For chicks, ref 088 suggests that if a vehicle needs to be parked prior to offloading, it should be positioned facing the wind to avoid draughts and sudden temperature drops.
33. In the case of chick transport, one guide (ref 091) advises that empty crates are not to be reloaded for sanitary reasons.

CONCLUSIONS: There is a lot of information on the correct way to unload poultry transport vehicles. Considerable attention is paid to climatic circumstances, to minimise the impact on the birds' welfare. Information is missing regarding the handling of day old chicks or pullets when unloading at a rearing farm.

Handling

34. Two documents (refs 013 and 028) recommend that the catching crew should be trained. Ref 013 also proposes a template for an agreement notice, which guarantees that all staff is properly trained.
35. Eight documents provide advice on the proper handling of birds. All agree that handling is done in a way to avoid injuries and pain, but they give different recommendations. Six favour an upright position of the bird by carrying it with two hands and supporting the chest. Moreover, in case animals are carried by their two legs, the time they are upside down is as short as possible (refs 134, 063, 133, 119, 007 and 108). One document adds that hitting the birds against e.g. walls or pen fixtures should be avoided (ref 133). Two documents (refs 146 and 149) advise that, if birds are carried upside down, having them against the catcher's body will help to keep the bird calm. In the particular case of turkeys, a conveyor belt to transport the birds to the vehicle and crates can be used to minimize stress (ref 063).
36. The way that birds are manipulated has to be adapted to their body weight (ref 149): turkeys of less than 5kg must be caught and carried by both legs with no more than 1 bird in each hand; turkeys of 5kg and over must be caught and carried individually by the legs and shoulder (using two hands) and kept close to the body.
37. Two documents specify the maximal number of birds to be held in one hand. Ref 007 recommends carrying up to 4 hens or chickens over 2kg in one hand, or 5 chickens if less than 2kg. In contrast, ref 146 recommends not exceeding 3 chickens in one hand.
38. There are three documents which recommend mechanical catching (refs 134, 062 and 107), but only one document (ref 133) which advises on aspects related to mechanical catching such as the removal of litter and dead animals before catching starts.
39. One document mentions the use of a breast support slide to reduce damage of the breast (ref 007) during loading into the crate.

CONCLUSIONS: There are several documents on the proper handling of birds during loading, but the recommended practices differ regarding the most appropriate way to carry animals and the number of animals to carry at one time. Information is missing on the handling of day old chicks.

Other specific issues

40. Six documents refer to decontamination of the equipment and to other biosecurity measures. Two of them detail the procedure very accurately (refs 088 and 091). Ref 091 encourages weekly controls to verify that decontamination is actually and properly done. Ref 035 lists the most effective techniques for decontamination.
41. Four documents (refs 091, 107, 120 and 088) agree on recommendations regarding the way a vehicle should be driven: carefully and smoothly, not exceeding 85km/h, using good roads, with prior planning of the journey.

CONCLUSIONS: Detailed recommendations are available on biosecurity measures and aspects related to the driving of the vehicle.

Space allowances

42. Seven documents recommend that space allowance has to be adapted to climate conditions, by decreasing the number of birds when ambient temperatures are high. Two of them propose increasing space allowance by 10% when temperatures exceed 20°C for broilers (refs 134 and 063) or 25°C for turkeys (ref 149) and ref 030 recommends removing three broilers per crate in hot conditions. Ref 088 proposes that chicks are unloaded and reloaded with higher space allowance per box, in the event of a power failure.
43. Five documents agree on the fact that poultry are transported in crates with dimensions providing enough space so that air can be circulated over the birds' heads but also space that cannot allow to birds to stand. Thus the height of crates is to be adapted. Ref 007 gives some figures (for day old chicks: 12 cm; for broiler: 23 cm; for starter pullets, spent hens: 25 cm; for turkeys: 32 cm)

CONCLUSIONS: Most of recommendations found on the space allowances required during poultry transport are strictly compliant with the regulation (good practices, not best). However, we found that height recommendations are lacking in the regulation (for example crate height).

Watering and feeding

44. Three documents present the regulatory requirements about chicks (refs 120 and 133) and about adult poultry (refs 028, 120 and 133).
45. One reference recommends feeding and watering animals at the slaughter plant (ref 005) but another recommends feeding and watering birds after unloading except for birds intended to be slaughtered (ref 028).
46. One document recommends releasing poultry in a shed where they have access to feed and water or to arrange for emergency slaughter if a delay of more than 24h is expected during transport (ref 007).
47. Eight documents contain advice related to fasting time. Two of them recommend a minimum fasting time prior to transport to avoid the faeces dropping onto the lower levels in the vehicle (ref 119: 4 h; ref 133: 6h). Three indicate a maximum food deprivation period of 10 h (ref 146) or 8h (ref 063) for all poultry species and 6h for turkeys (ref 149).
48. No recommendations were found describing the way to feed and water poultry during transport.

CONCLUSIONS: Most of references on feeding and watering in connection with journey time, are strictly compliant with the regulation. Advice on fasting differs between documents, but is consistent in a sense that minimum fasting times are lower than maximum fasting time. Information on how to feed and water poultry during transport is missing.

Managing air flow and temperature

49. Three documents refer to climate conditions during transport for chicks. They differ only slightly in their recommendation of the most appropriate temperatures: 22-23°C (ref 088) and 25°C +/- 2°C (ref 091, 063). Ref 083 and ref 091 present figures for air speed and air replacement. Ref 088 provides practical advice on how to deal with extreme weather conditions in case of failure, or in summer or winter.
50. Eight documents refer to the optimum temperature for the transport of poultry, although it is not always clear if this is related to the ambient conditions or inside the crates. The instructions differ slightly: at least 23-24°C and preferably 20-21°C (refs 115, 116, 117 and 118) or 23-28°C (ref 088).

51. Some documents add recommendations about air speed (refs 088 and 063) and humidity (ref 088).
52. Three documents propose sensors to check temperature inside the vehicle (refs 088, 119 and 091). Ref 088 advises calibrating the probes 2 to 3 times per year.
53. Five documents address the issue of the protection of birds against harmful weather conditions. Document 007 identifies the risk areas in a vehicle: in the back of the vehicle because of cold stress, and at the top front of the vehicle because of heat stress. Ref 064 advises to avoid local draughts.
54. Two documents mention the way to schedule vehicles arriving at the slaughterhouse in order to facilitate air flow (refs 088 and 119). Ref 119 presents drawings.
55. Refs 063 and 064 recommend setting up forced ventilation (poultry vehicles are not equipped at the moment) for the journey over 4h when humidity exceeds 70% and temperature 28°C.

CONCLUSIONS: There is general agreement that climatic conditions on board vehicles are relevant to animal welfare, and there are specific figures regarding the optimal temperatures. However, there is some disagreement on what is the optimal temperature range. It is also not clear if the figures are given for outside climatic conditions, vehicle microclimate or in-crates microclimate. Information is missing concerning the humidity conditions in the vehicle, and the link between humidity, temperature and space allowance.

Journey time

56. Five documents propose journey times different from the Regulation (day old chicks: refs 134, 007 and 063; broilers: refs 063 and 146; turkeys: ref 149).
57. Three documents propose a reduction (compared to the Regulation) of the time between hatching and unloading (60h instead of 72h: refs 134 and 007) or between hatching and feeding (48h: ref 063)
58. Two documents advise reducing the distance between the hatchery and the farm or between the farm and the slaughter plant (refs 107 and 119) without specifying. Three documents propose a maximum time for the birds in containers. Ref 063 proposes 6 hours. According to one source (ref 146) broilers should be

slaughtered within 8h after the first bird is loaded, and turkeys within 6h with a maximum transport duration of 4h (ref 149).

CONCLUSIONS: The references identified advise measures which go beyond the Regulation: recommended journey times are shorter. They also specify that journey times should include all steps, not only the transport phase: the journey time should start from when the first bird is loaded and end when the last bird is unloaded.

Resting periods

59. Four documents propose specific measures related to resting periods (refs 123, 088, 091 and 007).
60. Ref 123 refers to the provision of food and water during resting periods without specific instructions on how to do this. Three documents agree on avoiding stops, especially during the hottest hours of the day (refs 088, 091 and 007).

CONCLUSIONS: Resting period recommendations differ between references. Moreover detailed information on how to treat animals during a resting period is lacking.

2. Poultry: Overview table

Fitness for transport

Poultry category	Legislation (Regulation 1/2005)	Suggested good practice (improvement of compliance with the legislation)	Suggested best practice (upgraded standards)
All except chicks	Article 3 (b): the animals are fit for the journey Article 20 (2,a) Annex 1, chapter 1	(Refs 120, 028, 133, 123) Check the animal fitness for transport. Unfit animals are not loaded (Ref 007) Unfit birds removed prior to the arrival of transportation (Refs 007, 028) There should be sufficient lighting to permit inspection. A torch or other device should be used where light is insufficient.	(Ref 007) If flooding occurs in sheds housing poultry on the floor, dry bedding should be provided, where practical, in order to minimise the problem associated with transporting wet birds. (Ref 063) birds should be protected from wetting at all times and particularly when air temperature is <8°C. Wetting birds should not be loaded close to air inlets on the vehicle, if temperature is <8°C wet birds should not be transported (Ref 013) Non fit animals are euthanized before catching crew arrives (Ref 013) Both farmer and catching crew check animals fitness for transport (Ref 123) A veterinary guarantees fitness for transport and adapted equipment
Chicks	Annex 1, chapter V, 2.1.b		(Refs 088, 134) Chicks are sent as soon as possible after hatching
Spent hens	Annex 1, chapter V, 2.1.b	(Refs 063, 064) hens with broken bones should not be transported	(Ref 015) dark, red, purple or black combs or wattles; discharge from eyes nostrils; swollen head/neck; skin on head or neck is dark red or very pale (exception for Toms); Bloody and/or prolapsed vents; emaciated and weak : very thin, easily felt breastbone (careful, could be visible for laying hens without real emaciation); dislocated, broken or exposed bones (including injury due to handling); unable to rise or walk due to physical abnormality or injury. (Ref 015) Assessment needed to know if birds are fit to transport or not (joint decision by producer, catching crew, hauler, and processing plant) : environmental problems : wet birds in cold weather, heat and / or humidity; cold and/or wind chill; road closure; individual bird with minor trauma, wounds or bleeding (including injury due to handling); flock : diarrhoea, coughing and sneezing - "snicking", if a flock is diagnosed with a disease by a vet or lab, special provisions may be required.
Broiler	Annex 1, chapter V, 2.1.b	(Ref 063) Lame broilers should not be transported	

Means of transport

Poultry category	Legislation (Regulation 1/2005)	Suggested good practice (improvement of compliance with the legislation)	Suggested best practice (upgraded standards)
All	Article 3.c. Article 3.d. Annex 1, chapter II.	(Ref 013) Truck must be adapted to transported animals, well maintained, clean and functioning (Refs 120, 091, 133, 119, 028) Check the authorisation of the truck and driver for live animal transport (Refs 008, 133, 028) Check journey log. Special attention to journey exceeding 8h (Refs 013, 088, 134) Use solid (rigid = chipboard or plastic), safe and clean containers	
Chicks	Article 3.c. Article 3.d. Annex 1, chapter II.	(Refs 088, 091) Check proper functioning of the truck (fans, air conditioning, misting)	
Broilers, turkeys, spent hens	Article 3.c. Article 3.d. Annex 1, chapter II.1.1.	(Refs 024, 007, 120) Transport containers (i.e., cages) cannot be less than 20 cm wide and 25 cm high, and be properly designed (e.g., to prevent escape from, or the protrusion of any part of the bird through the container); containers should be ventilated. (Refs 107, 134, 028, 007) Use container with wide opening. Cage doors should be as large as practical, and not less than 20 cm wide and 22 cm high. (Refs 133, 028) Containers designed to prevent injuries (Ref 021) Containers of more than 50 kg have to be equipped with sufficient and adequately designed safety devices, to which they can be lashed to the means of transport (Ref 133) Containers in accordance with regulation	
All	Article 3.c. Article 3.d. Annex 1, chapter II.1.1.	(Ref 120) Non-slip surface of levels (Ref 119, 091) Birds are protected against climate conditions by the truck	(Ref 041) The use of wire bottomed cages must be discouraged as it may damage the toes of birds if they get caught between the wire and the floor (Refs 088, 007) Check load after 2 hours or even 30 min (Ref 133) Provide sufficient light and adequate tools (ex: stairs) to facilitate the animal inspection during transport
Chicks	Article 3.f Annex 1, Chapter II.1.1.	(Ref 088, 091) Have a truck checking procedure. Check documents and loading (quantity, identification, quality) (Ref 091) Truck designed to prevent flight and injuries	(Ref 091) All the animals are accessible (for control and/or treatment)

Loading

Poultry category	Legislation (Regulation 1/2005)	Suggested good practice (improvement of compliance with the legislation)	Suggested best practice (upgraded standards)
Broilers, turkeys, spent hens	Annex 1, chapter III.1.	<p>(Ref 013) Farmer is present during capture, if not, farmer is reachable by phone and a substitute is present.</p> <p>(Ref 008 and 146) Design an operator responsible for animal handling and loading procedures. He must be:</p> <ul style="list-style-type: none"> • supervising, monitoring and maintaining high welfare standards throughout the catching process and loading of birds onto transport vehicle • inspecting transport modules to ensure they are intact to eliminate the risk of injury to the birds during loading and transport. <p>(Ref 013, 007, 008, 133, 119, 146) Insure good catching conditions:</p> <ul style="list-style-type: none"> • accessibility by truck • blue light <15lux, by night, reduced light intensity • good maintenance • adapted equipment • respect clean and dirty zones • wear appropriate clothes (overall, hygiene caps, boots swabs) • have clean and disinfected hands and clothes 	(Ref 107) Have adapted zone to manoeuvre the truck and equipment
Range birds		(Ref 007) More easily loaded by moving them in small groups.	
Broilers, turkeys, spent hens	Article 5.2. Article 22 Article 3.c. Article 3.d.	(Ref 013) Make sure the equipment is well maintained	<p>(Ref 013) Use a checking list for capture (conditions at the farm, catching procedure)</p> <p>(Ref 013) Make sure all the escaped birds are caught (outside the building, around and under the truck)</p>
Chicks	Annex 1, chapter II.1.1.	<p>(Refs 088, 091) If normal space allowance is used, preheat the truck (T=20-25°C before loading). If low space allowance is used, do not preheat the truck</p> <p>(Ref 088, 091) Insure good catching conditions :</p> <ul style="list-style-type: none"> • respect clean and dirty zones • wear appropriate clothes (overall, hygiene caps, boots swabs) • have clean and disinfected hands and clothes <p>(Ref 091) Respect access, circulation and security protocol specific to each site</p>	
Broiler, turkeys	Annex 1, chapter II.1.1.		(Refs 146, 149) In case of partial depopulation, the use of partition, such as curtains or straw bales, to separate caught birds from those remaining in the shed, is strongly recommended. The partition should: a) be erected at a suitable time prior to catching to allow all birds time to settle b) provide protection from noise, dust and disruption from the catching team during catching operations c) help

			control the thermal environment by, for example, preventing draughts d) not reduce the floor available to those birds not being caught to such an extent that the maximum stocking density of 30 kg/m ² is exceeded. The catching process should be managed sympathetically to minimise the above
Broilers, turkeys, spent hens	Annex 1, chapter II.1.1.	(Ref 134) Reduce catching time by bringing containers close to caught birds Bigger catching crew to reduce catching time and hasty work (Refs 107, 149, 007) Planning the catching and loading procedure well in advance will allow adequate time for birds to be handled quietly in a way that does not cause them injury. (Ref 028) Planning and execution of the journey must be known by a referent at any time	
Turkey	Annex 1, chapter II.1.1.		(Ref 149) During catching a) Partition must be used to segregate the flocks into groups of 50 to 100 birds (depending on bird size) b) the partitions must be continually relocated as repletion progresses to maintain a) Segregating the flocks into smaller groups for catching makes the catching process more manageable. The birds are easier to catch as they are contained in a smaller area, the birds can be retained closer to the modules, which limits the distance they have to be carried, and the likelihood of trampling and smothering is reduced. Partition often comprise of 244 x 122 cm (8 x 4ft) plywood sheets on framing, which extend out from the side of a shed toward the centre. Modules are placed between the 2 partitions to form the catching area.
Broilers, turkeys, spent hens	Annex 1, chapter III.1.6.	(Ref 107, 108) In summer, catching is planned as late as possible (twilight) and space allowance is higher. In winter, containers are covered up (top and sides)	(Ref 107) In case of high temperatures, drive the truck between two loading phases
Chicks	Annex 1, chapter III.1.7.b	(Ref 134, 021) Crates must be well wedged in order not to fall or move	(Ref 021) Clear identification at the top edge of the container ("Up")

Unloading

Poultry category	Legislation (Regulation 1/2005)	Suggested good practice (improvement of compliance with the legislation)	Suggested best practice (upgraded standards)
Broilers, turkeys, spent hens	Article 8.2. Article 20 (2,a) Annex 1, chapter 1	(Refs 013, 028) Slaughterhouse staff check the flock before unloading (Ref 013) Transporter informs about birds state, stress and transport conditions (Ref 119) Reduce waiting time between unloading and slaughtering	
Chicks	Annex 1, chapter II	(Ref 088) Avoid draughts (Ref 088) Collect chicks and litter samples before unloading (Refs 088, 133, 007) Quick unloading and placement in a brooding environment to avoid temperature decrease (Ref 091) No empty crate is reloaded (Ref 088) Keep on ventilating while unloading (Ref 091) Have a delivery note signed	(Ref 088) Park the truck into the wind to avoid temperature drop (Ref 091) Sample, using latex gloves : 20 crates at random. Litter sample cut into 4 pieces (2 for the farmer, 2 for the hatchery) (Ref 091) Delivery delay, incorrect quantity, stress of the products trigger alert
All	Annex 1, chapter II		(Ref 028) Documents completed in time
Broilers, turkeys, spent hens	Annex 1, chapter	(Ref 107) At slaughterhouse : covered platform and dynamic ventilation (Refs 133, 119) Protected unloading areas by extreme weather conditions, using heating or refrigeration system if necessary (Ref 012) Where facilities are not available for protection from the weather, birds in transit or waiting unloading for slaughter should not be required to remain in a parked vehicle for more than two hours.	
All	Annex 1, chapter	(Ref 028) Feed and water birds as soon as possible after unloading, except for birds intended to be slaughtered (Ref 008) Designate an operator responsible for animal handling and unloading procedures	
Broilers, turkeys, spent hens	Annex 1, chapter		(Ref 133) Injured, wet or with a high DOA% animals have to be separate from others and killed for first

Handling

Poultry category	Legislation (Regulation 1/2005)	Suggested good practice (improvement of compliance with the legislation)	Suggested best practice (upgraded standards)
Broilers, turkeys, spent hens	Article 3.e.	<p>(Refs 013, 028, 107) Catching crew is trained to manipulate animals to avoid cruelty and stress + human care and use of equipment</p> <p>(Ref 120) Loading and unloading operators must be trained on animal handling and cross contamination</p> <p>(Refs 133, 013, 119) Check the competence of operators in animal handling</p> <p>(Refs 133, 119) Avoid injuries and pain</p> <p>(Refs 133, 119, 134, 007, 108, 063) In case of manual loading lift up poultry by both legs, minimize the inversion time</p>	<p>(Refs 013, 028, 107) Employ professional and trained catching crew</p> <p>(Refs 133, 013, 119) Model of agreement notice to guarantee that all the staff members are trained for birds handling</p> <p>(Refs 134, 063) Birds should not be transported upside down, by the neck, by one leg or by the wings. Be careful that birds do not hit any object</p> <p>(Refs 133, 119, 134, 007, 108, 063) Birds are caught one by one with two hands and supported by the neck/chest; especially for spent hens</p>
Spent hens	Article 3.e.	<p>(Ref 007) 1 person should remove the bird from the cage and hand it to a second person, in a manner that allows up to 4 hens to be carried at a time in each hand. Hens must be held by both legs.</p>	<p>(Ref 007) A breast support slide is recommended as it significantly reduce damage to the breast. It is made of sheet of metal, rests in the feed trough and provides a smooth angled surface on which the bird slides out of the cage.</p>
Broilers, turkeys,	Article 3.e.	<p>(Ref 007) If broiler chickens are loaded by hand, up to 5 chickens <2 kg should be carried in each hand; up to 3-4 chickens > 2kg in each hand</p>	<p>(Ref 146) No more than 3 broilers must be carried in one hand</p> <p>(Ref 146) When carrying by the legs, resting of the bird's breast against the catcher's leg during carrying can help keep the bird calm. It is strongly encouraged that birds be both caught and carried individually by the body using both hands to hold the wings against the body so that the birds are not inverted</p> <p>(Refs 007, 063, 149) Turkeys may be herded towards the loading area and even into the container or vehicle. Segregating the flock into smaller groups for catching makes the catching process more manageable. The birds can be retained closer to the modules, which limits the distance they have to be carried.</p> <p>(Refs 063, 149) The loading of turkeys should be carried out as gently as possible using conveyor belts or similar aids to reduce handling stress of the animal</p> <p>(Ref 149) The method of catching turkeys by hand must take into account the weight and size of the birds, and be adjusted accordingly. Specifically:</p> <ul style="list-style-type: none"> • Birds weighting less than 5 kg must be caught and carried by both legs with no more than 1 bird in each hand; birds must be placed in the crate one at a time. • Birds weighting 5 kg and over must be caught and carried individually by grasping the shoulder of the wing furthest away from the catcher, whilst using the other

			hand to hold both legs; Birds must be lifted and held close to the body and placed into the crate with care.
Broilers	Article 3.e.		(Refs 134, 062, 107) Improvements for catching: <ul style="list-style-type: none"> • animal penning • mechanical catching if the machine is carefully designed • regular technical monitoring (growing curve)
Broilers, turkeys	Article 3.e.	(Ref 133) In case of mechanical loading, remove turkeys before the litter in the barn and the dead animals	

Other specific issues

Poultry category	Legislation (Regulation 1/2005)	Suggested good practice (improvement of compliance with the legislation)	Suggested best practice (upgraded standards)
Chicks	Annex 1, chapter II.1.1.	<p>(Ref 088, 091) Decontamination procedure for crates and equipment, air conditioning circuits, turbines, extractors, tailgate, inside and outside of the truck (to be done after each round) :</p> <ul style="list-style-type: none"> • dusting, jet of water (drinkable water) • detergent foam (5-10 min) (approved detergent and respected dosage) • rinse (120 bar) from top to bottom • disinfectant spraying from bottom to top • inside fumigation (once a week) <p>(Ref 091) Critical points:</p> <ul style="list-style-type: none"> • Ventilation circuit, movable equipment, frame and wheel. • Leave a clean decontamination station • Make sure cleaning water is collected <p>(Ref 091) Wash hand before and after decontamination</p>	(Ref 091) Control decontamination once a week (swab to control salmonella)

All	Annex 1, chapter II.1.1.	(Refs 091, 008) Wear adapted outfit (boots, gloves, glasses, overall, mask)	(Refs 091, 008) Use disinfected overall and boots (Ref 035) Cleaning of poultry transport crates is essential in order to reduce microbiological contamination. The most effective techniques involved: <ul style="list-style-type: none"> • the use of brushes • using hot water (60oC +) in soaking and spraying • the use of hot water with detergents • ultrasonic • and the use of high concentrations of disinfecting chemicals (Ref 028) Documents proving that cleaning and disinfection are performed with officially approved installations
All	Article 3.c. Article 3.d.	(Refs 088, 008, 133) Truck, containers and cages are clean and disinfected. (Refs 007, 028, 013) The driver is responsible for the protection and the welfare of animals, from when they are in the containers.	(Refs 007, 028, 013) Responsibility definition: <ul style="list-style-type: none"> • Farmer is responsible for housing (light, ventilation) and for ensuring that only fit and healthy birds are selected for travel • Catching crew is responsible for catching and loading • Transporter is responsible from farm to slaughterhouse • Slaughterhouse is responsible for unloading, waiting and slaughtering
Chicks	Article 3.c. Article 3.d	(Refs 088, 091) Transporters should not have any contact with poultry at home or in other professional activities (Ref 091) Avoid contact between birds of different sanitary status (Ref 091) Drivers have enough clothing in their trucks for the delivered sites (Ref 091) Drivers do not enter poultry housings. Farmers do not enter trucks	
Broilers, turkeys, spent hens	Article 3.c. Article 3.d		(Ref 013) Slaughterhouse is responsible for written program for animal welfare during previous step (including transport)
All	Article 3.f. Annex 1, chapter II.1.1.	(Refs 091, 107, 120, 088) Drive carefully/smooth = do not exceed 85km/h, choose better roads = plan the journey (itinerary and stops)	(Ref 013) Contingency plan production, for example: decision-making tree in case of an urgency situation
Broilers, turkeys, spent hens	Article 3.f. Annex 1, chapter II.1.1.		(Ref 008) Communication between farms and slaughterhouse for transport planning (Ref 013) Communicate about any problem or anormal situation Write down date and hour of every change in responsible, weather conditions, transport conditions... (Ref 013) Following documents should be on board: <ul style="list-style-type: none"> • decision tree to decide if birds can be loaded or not

			<ul style="list-style-type: none"> • contacts detail for key resource persons in case of an urgency • model for checking list to fill before loading birds • model of investigation report on mortality at slaughterhouse arrival
Chicks			(Ref 088) Be equipped in case of problem (ex: high-visibility jacket) and have a list of repairers

Space allowances

Poultry category	Legislation (Regulation 1/2005)	Suggested good practice (improvement of compliance with the legislation)	Suggested best practice (upgraded standards)
Chicks	Annex 1, chapter VII.E. Densities applicable to the transport of poultry in containers. Minimum floor areas shall be provided as follows: Day-old chicks 21 — 25 cm ² per chick These figures may vary depending not only on the weight and size of the birds but also on their physical condition, the meteorological conditions and the likely journey time	(Refs 013, 120) Respect loading density (Ref 077) In normal conditions, a chick should be given 23 cm ² (435 chicks/m ²) but in cold weather, space may be reduced to 21 cm ² (472 chicks/m ²)	(Refs 088, 119) Adapt density according to the temperature = reduce the number of animals per cage in case of high temperature
Broilers, turkeys, spent hens	Annex 1, chapter VII.E. Densities applicable to the transport of poultry in containers Minimum floor areas shall be provided as follows: • < 1,6kg: 180 — 200 cm ² • 1,6 to < 3kg: 160 cm ² • 3 to < 5 kg: 115 cm ² • > 5 kg: 105 cm ² These figures may vary depending not only on the weight and size of the birds but also on their physical condition, the meteorological conditions and the likely journey time	(Refs 013, 133, 021) Respect loading density according to species, age and weight (Refs 107, 133) Be informed about animals' weight to adapt density (Refs, 134, 028, 120, 007, 063) Crates height does not allow standing birds (to avoid falls and injuries) but sitting comfortably during transport.	(Ref 077) space requirement for adult poultry a range from 250 cm ² to 500 cm ² / bird should be considered according to the weight of birds (from 1 kg to 5 kg respectively) (Ref 127) The number of DOA birds can easily be reduced by lowering the loading density, where the number of birds DOA will increase by 1.1% for every additional bird in the compartment. (Refs 134, 063) Adapt density according to the temperature; increase space allowance by 10% in case of hot weather conditions (>20°C) (Ref 065) An empirical decision is also made in hot and humid weather to reduce the number of birds per crate. This reduction is compromised between reduced number of birds per crate to prevent suffocation / heat stroke and the need to put sufficient birds in one crate in order to prevent lateral movement which may result in physical injury. (Ref 030) 3 broilers could be removed from the crate in case of abnormal hot conditions compared to normal temperature (Refs 133, 107) Regular technical monitoring to know growing curve

			(Ref 149) Adapt density according to the temperature; increase space allowance by 10% in case of hot weather conditions (>25°C)
All			(Ref 007) Height requirement for chicks is 12 cm; for broiler: 23 cm; for starter pullets, spent hens: 25 cm; for turkeys: 32 cm.
Chicks			(Ref 088) In case of engine failure, unload and reload with lower density

Watering and feeding

Poultry category	Legislation (Regulation 1/2005)	Suggested good practice (improvement of compliance with the legislation)	Suggested best practice (upgraded standards)
Chicks	Article 3.h.	(Refs 120, 133) Provide water and food for travels lasting more than 24h	
Broilers, turkeys, spent hens	Annex 1, chapter III.2.7.	(Refs 028, 120) If transport is short enough (<12h), no need to water or feed animals (Refs 120, 133) Provide water and food for travels lasting more than 12h (Ref 028) Feed and water birds as soon as possible after unloading except for birds intended to be slaughtered	(Ref 005) Water and feed at slaughter plant (Ref 007) When a delay is anticipated and holding time is likely to exceed 24 hours, birds should be released into a shed where they have access to feed and water, or immediate slaughter should be arranged at another slaughterhouse
Broilers, turkeys, spent hens	Annex 1, chapter III.1.7.a	(Refs 107, 028, 120) Respect empty stomach to avoid the faeces fall on the lower levels (Ref 119) Do not load animals before 4 hours of fasting	(Ref 133) Stop animal feeding 6 hours before transport (Ref 063) Fowl not deprived of food more than 8h (Ref 146) No birds must be deprived of food for more than 10h prior to slaughter. Birds must have access to water up to the time of catching (Ref 149) For turkey, the time between the first bird loaded and the last unloaded must be less than 6h

Managing of air flow and temperature

Poultry category	Legislation (Regulation 1/2005)	Suggested good practice (improvement of compliance with the legislation)	Suggested best practice (upgraded standards)
Chicks	Annex 1, chapter III.1.7.c Annex 1, chapter II.1.2. Annex 1, chapter III.2.6	(Refs 091, 063, 088) Recommendation for chicks: <ul style="list-style-type: none"> • temperature = 25°C (+/- 2) • hygrometry = 55 to 70% • air speed = 0,05 to 0,10 m/s • air renewing = 10 000 m³/h for 50m³ (Ref 088) Recommended temperatures = 23-28°C in expedition room / 20-25°C truck during loading / 23-28°C truck during transport (Ref 088, 091) Homogeneous loading	
Turkey Chicks	Annex 1, chapter II.1.1.	(Ref 088) Temperature in the truck = 22-23°C (30°C in the crates), Hygrometry = 65%	
Chicks	Annex 1, chapter II.1.1.		(Ref 088) In summer, have full water tank to manage hygrometry. If it is very hot, get the truck to the cleaning station (Refs 088, 091) In winter, preheat the truck at 18°C before loading Or even between 20 and 25 °C (Ref 088) In case of hygrometry failure, water the floor of the truck
All	Annex 1, chapter II	(Ref 088) Standardisation of probes 2 to 3 times a year (Refs 120, 133) Ensure ventilation systems are working	(Refs 063, 064, 028) Forced ventilation should be developed to minimize heat stress. It should be used when ambient temperature and relative humidity rise above 28°C and 70%; and for journeys of 4 hours or over
Broilers, turkeys, pullets, spent hens	Article 3.f.	(Ref 064) Localised air velocities should be avoided on passively ventilated vehicles by close attention to curtain construction and air inlet control (Ref 063) In hot weather, birds should be transported during the coolest time of the day (Ref 088, 119) Regular temperature checking (ex : at control post and slaughterhouse)	(Ref 063) For conventional poultry transporters a ventilation rate of 0.6m ³ .s ⁻¹ per tonne live weight of birds results in lower mortality
Chicks	Article 3.f	(Ref 091) Record temperature and hygrometry with proper probes	

Broilers, turkeys, pullets, spent hens	Annex 1, chapter III.1.7.c Annex 1, chapter II.1.2. Annex 1, chapter III.2.6	(Ref 088) Crates must be well arranged with corridor for air circulation. Manage sufficient space above the crates to have a good volume of air. Avoid overloading, especially when high temperatures (Refs 119, 007) Use covers for truck in case of cold weather; especially for birds at the back of the vehicle which are more susceptible to cold stress (Refs 005, 119) Protection against harmful weather (Ref 028) To protect birds from adverse weather conditions (direct sunlight, heat, wind, rain and hail), flexible screens on trucks should be available (Ref 149) Provide cooling (Ref 007) Birds at the top front of the truck must be protected from heat stress	(Ref 119) Leave 10cm of free space between cages every two lines or use empty cages at regular intervals
Broilers, turkeys, spent hens	Annex 1, chapter 2	(Ref 063) Recommended air speed = 0,05-0,10 m/s	(Ref 133) Truck temperature between 24-26°C (Refs 115, 116, 117, 118) In crate temperature should be maintained below 23-24°C and preferably around 20-21°C. (Ref 009) Additional ventilation before unloading

Journey times

Poultry category	Legislation (Regulation 1/2005)	Suggested good practice (improvement of compliance with the legislation)	Suggested best practice (upgraded standards)
Chicks	Annex 1, chapter V, 2.1.b		(Ref 134) Maximum delay between hatching and unloading = 60h (Ref 063) Preferable time between hatching and provision of food and water should be 48h
All	Article 3.a.	(Ref 107) Reduce distance between hatchery and farm / farm and slaughterhouse (Refs 119, 088) Reduce transport distance, time and stops	
Broilers	Article 3.a.		(Ref 146) Broilers must be slaughtered within 8h of loading the first bird into a module

Broilers, turkeys, pullets, spent hens	Article 3.a.		(Ref 063) Fowl should not be held in containers for longer than 6h
Turkeys	Article 3.a.		(Ref 149) For turkey, the time between the first bird loaded and the last unloaded must be less than 6h. The time from when the turkeys leave the farm to arriving at the processing plant must be no longer than 4h.

Resting periods

Poultry category	Legislation (Regulation 1/2005)	Suggested good practice (improvement of compliance with the legislation)	Suggested best practice (upgraded standards)
All	Annex 1, chapter II.1.1.	(Ref 123) Birds are protected against climate conditions; Provided with food and water; and appropriate accommodation for unloading	(Refs 088, 091, 007) Avoid stops, especially at hottest hours (including lunchtime)

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