

Best Practice Guide Pigs
Best Practices for Transport



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1 Objectives and structure

What are the objectives of this Best Practice Guide?

The **Best Practice Guides (BPGs)** aim to improve animal welfare by giving recommendations and advice to all stakeholders that are involved in the production of fattening pigs and broiler chickens. They have been developed as part of the **aWISH project (Animal Welfare Indicators at the Slaughterhouse)** and contain numerous measures, the so-called "Best Practices", that can be implemented on farm, during transport and at the slaughterhouse to ameliorate the welfare of pigs and broilers throughout the whole production chain.

This BPG focuses on Best Practices regarding the **transport of pigs**.

Transport is a critical stage in pig production and can have a significant impact on animal health and welfare. The EFSA AHAW Panel (2022) identified several welfare consequences associated with the transport of pigs. These include group and handling stress, challenging temperature conditions, restriction of movement and prolonged times of hunger and thirst. It is therefore essential to ensure that transport is carried out carefully and responsibly in order to minimise stress and to maintain high welfare standards throughout the journey. The Best Practices listed in this guide refer to ensuring animal welfare and are based on scientific literature, expert surveys, and experience gained in the EU project aWISH.

Who is this Best Practice Guide intended for?

This BPG is intended for transport companies and drivers, handling personnel, advisors, veterinarians, scientific experts, policymakers, and anyone involved in the transport of pigs.

How is this Best Practice Guide structured?

The recommendations provided in this BPG should lead to an increase in pig welfare during transport that is reflected in the (automatic) welfare monitoring at slaughterhouse level.

This BPG follows the different steps of transport, from planning the journey and handling the pigs to the journey itself. For each section in this guide, potentially affected animal welfare domains are listed, referring to the five domains model (1 Nutrition, 2 Physical Environment, 3 Health, 4 Behavioural Interactions and 5 Mental State) (Mellor et al., 2020). In addition, the animal welfare indicators (AWI) studied in the aWISH project that are affected in that section are identified. Afterwards, a detailed description of Best Practices is provided that can improve animal welfare in this area.



2 Planning the journey

Factual background

The welfare of pigs must be the top priority from the start of transport until unloading (beginning with the first pig loaded onto the vehicle until the last pig being unloaded at the destination) and further handling at the location of arrival –. Transport stress in pigs can be triggered by the transport itself (e. g. distance and duration of transport, climatic conditions, changes in the pigs' accustomed daily routine, road conditions as well as speed and design of the vehicle). However, pre-transport conditions (including a lack of adequate preparation before transport) can substantially impact animal welfare as well (Minka and Ayo, 2009).
Transport starts before the journey – with planning. A well-planned journey can significantly improve animal welfare and reduce stress for both involved persons as well as the animals. EU Regulation (Council Regulation (EC) No. 1/2005) sets out specific requirements for ensuring animal welfare during transport — this also applies to the planning phase. Before transport, all necessary precautions must be taken to keep the duration of transport as short as possible and to take into account the animals' needs during transport. Transport to the final destination must take place without any avoidable delays, and the animals' well-being should be monitored regularly. The transport route must be carefully planned, and it must be ensured that the animals are provided with food and water at appropriate intervals. In addition, the animals must be allowed to rest at appropriate times. To this end, the provisions of Regulation 1/2005 must be strictly followed.

Affected welfare domains[1]: Nutrition, Health, Mental state

Affected AWI: Not applicable

Best Practices

- **Transport plans** must be drawn up in detail prior to transport and recorded in an electronic register that enables the tracking and monitoring of animal transports throughout the EU. To this end, the **national contact authority** responsible for authorizing the transport must be contacted. Transport may not begin until authorization has been obtained.
- Care must be taken to **compile all necessary documents** (e.g. vehicle and company registrations, staff certification) well in advance so that everything can be submitted to the authorities on time.
- **Transport documents** must be prepared in accordance with the provisions of EU Regulation 1/2005 and carried on the transport vehicle.

[1] Referring to the Five Domains Model of Animal Welfare (Mellor et al., 2020), a science-based framework to assess animal welfare. The model includes 5 domains that are assessed: 1 – Nutrition, 2 – Physical environment, 3 – Health, 4 – Behavioural interactions, 5 – Mental state.



- The **maximum transport times** as well as the **mandatory rest periods** and stopovers, including unloading of the animals, as specified in **EU Regulation 1/2005** must be strictly adhered to. It is recommended that transport times should be kept shorter than those specified in Regulation 1/2005. Eurogroup for Animals (2024) proposes to limit transport times to a maximum of 8 hours for weaned pigs and a maximum of 4 hours for pigs transported for slaughter. This includes loading and unloading times. Further, calculating the transport times based on an average vehicle speed of 70 km/h is recommended (Eurogroup for Animals, 2024).
- When planning long-distance transport, the **weather and temperature trends** during the planned transport period must be taken into account. If very high temperatures are expected along the route as well as during loading and unloading, the transport should be cancelled or postponed. To avoid heat stress in animals, it can help to set a **limit for the outdoor temperatures** in which pigs are allowed to be transported. It is recommended to avoid transport when temperatures exceed 25° C, however this might not always be feasible. For more information on how to deal with transport in hot weather, see chapter 6 “Climate on transport”.
- Long transports and transports across country borders can be especially challenging for the animals as well as transport personnel. From an animal welfare perspective, **transports of more than 8 hours should not be conducted**. When preparing for long transports, **waiting times at the borders should be factored into the journey length**. It needs to be ensured that there is **enough feed and water** available even when waiting times take longer and that **ventilation stays consistent**.
- For longer journeys, it is also important to **clarify prior to transport where the animals can be unloaded**. This is especially important for transport into third countries.
- Before each transport, a **mandatory contingency plan** must be developed. The use of artificial intelligence and advanced route planning algorithms can support transport planning, reducing distances and travel time.
- It is important to ensure that only **qualified personnel** carry out the transport.



3 Fitness for transport

Factual background

Fitness for transport is the key requirement for a transport to start. A pig is fit for transport if it can walk onto the vehicle on its own without the use of painful prodding devices and has no serious injuries or visible illnesses. In general, the following animals may not be transported according to EU-Regulation 1/2005: sows in the last 10% of their gestation period and up to 7 days after giving birth; newborn piglets with unhealed umbilical wounds; and piglets younger than 3 weeks (if the transport distance exceeds 100 km). An overview about key areas to focus on during fitness for transport inspections was developed in 2021 by the EU Reference Centre for Animal Welfare in Pigs (EURCAW Pigs, 2021) and included pathological processes such as lameness, prolapses, wounds and hernias as well as physiological aspects, such as genetically determined stress susceptibility or pregnancy. The following section lists the most important Best Practices and refers to earlier EU documents for more detailed information.

Affected welfare domains:	Health
Affected AWI:	Dead on arrival (DOA)

Best Practices

- Prior to transport, it is very important to ensure that **all animals are fit for transport** in order to avoid suffering and unnecessary stress.
- In the EU, it is **prohibited to transport piglets younger than 3 weeks** of age, as well as **sows in the last 10% of their gestation period and up to 7 days after giving birth**.
- Pigs that show **signs of impaired health and welfare** should not be transported. These signs include, but are not limited to:
    - Large open and/or bleeding wounds
    - Pigs that are unable to stand and/or walk
    - Severe lameness (no weight-bearing)
    - Hernias larger than 15 – 20cm and with lesions
    - Severely emaciated pigs
    - Rectal or uterine prolapse
    - Difficulty breathing

  Do not load these pigs!
- For more information on fitness for transport in pigs, several resources can be explored (e.g. Consortium of the Animal Transport Guides Project, 2017; *E-learning training materials to improve animal welfare during the transport and slaughter of cattle and*

pigs, 2023; EFSA AHAW Panel et al., 2022; Eurogroup for Animals et al., 2015; EURCAW Pigs, 2021).



4 Handling

Factual background

Gentle animal handling is a key component of transport and an important area to improve animal welfare. Pigs should always be handled and moved in groups, as this is less stressful for these social animals (Schrøder-Petersen et al., 2026). Training pigs to be driven on farm during the late finishing period seems to increase easiness of handling when they are transported (Faucitano and Goumon, 2018). However, not only the pigs should be trained, but also all staff handling the animals should receive training in non-aversive handling methods. Understanding the pigs' behavioural and sensory characteristics is important when interacting with animals. Studies using cognitive behavioural training of stock people showed that fear of humans could be reduced when people learned how to treat the animals in a positive way (Hemsworth and Wilhelmsson, 2024). Furthermore, it was shown that pigs raised in an enriched environment, in terms of more space allowance and straw bedding, were easier to handle at loading, showing that the rearing conditions should be considered as well when handling pigs (Faucitano and Goumon, 2018). There are also large differences between farms concerning the behaviour of stock people and the fear response of pigs to humans, indicating that the way the animals are treated play a role in their reactions on handling. However, genetic differences in pigs concerning their fearfulness are further discussed (Hemsworth and Wilhelmsson, 2024). The following Best Practices focus on handling pigs during loading and unloading when they are transported but can also be applied to any handling of pigs on the farm.

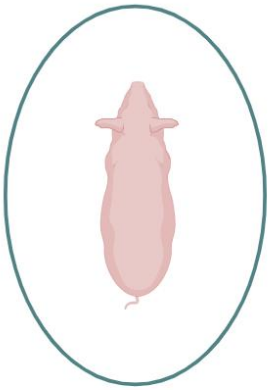
Affected welfare domains:	Health, Behavioural Interactions, Mental state
Affected AWI (related to the aWISH project):	Skin lesions, Vocalisation

Best Practices

- All staff handling the pigs should be **trained in non-aversive handling methods**. Live training and practice are preferred methods to gain hands-on experience. The training should be **refreshed regularly**.
- Pigs should be familiarised to handling prior to transport as this can lower stress and facilitate the loading process.
- Pigs should be handled **calmly and gently**, **without force or violence.**
- **Shouting** must be avoided and it is recommended to speak with a **quiet, gentle voice.**
- **Positive behaviour (e.g. talking, slow movement, pats, strokes, rubs)** should be used when interacting with the pigs. Speed and haste should be reduced. If a pig refuses to move forward, it should be given time to familiarise itself with the environment rather

than forcing it. More Best Practices for the moving of pigs can also be found in chapter 5.2 “Moving/driving of pigs”.

- The animals **flight zone should be used** to move them. The flight zone is the animals “personal space” and differs for each individual (see graphic). Pigs that are used to being handled can have a smaller flight zone than pigs that rarely come into contact with persons. Stepping into the flight zone at a 45° angle behind the shoulder motivates the pigs to move forward. Walking deep into the flight zone towards the animal from one side leads the pig to move into the opposite direction. However, stepping into the flight zone of an animal should always be done slowly and deliberately, as sudden movements can lead to panic. Several resources offer more in-depth information about the flight zone and how to move animals (e.g. Broom, 2005; Center for Food Security and Public Health Iowa State University, 2012; Consortium of the Animal Transport Guides Project, 2017; WOAH, 2011)



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- **Negative behaviour** (e.g. slaps, pushes, kicks, hitting and shocks with electric prodder) **as well as noisy implements such as rattles should be avoided**. Use paddles, boards or flags instead.
- Handling activities should be **monitored regularly by experienced persons**. **Feedback** can help handling personnel to improve their handling strategies and ensure that animal welfare friendly practices are being implemented.



5 Loading/Unloading

Factual background

The process of loading and unloading pigs poses many risks to their welfare. The animals leave their barn and move into unfamiliar environments. They are forced to move forward and have to climb up and down ramps which increases the risk of injury. The stress associated with loading results from different factors, such as group splitting, the design of the loading facility, and handling of the animals (Faucitano and Goumon, 2018).
The pigs should be moved quickly but carefully without using violence. When pigs are unloaded, they have often travelled long distances and spent many hours on the transport vehicle. Long waiting times on the transport vehicle should therefore be avoided, and the animals must be handled gently and examined carefully during unloading (Brandt and Aaslyng, 2015; Cobanovic et al., 2021). To ensure this, the operating staff must be properly trained (Holmes et al., 2020, Lipovšek et al., 2024). The loading/unloading process must be continuously monitored by the responsible staff (Anonymous, 2017). For this purpose, camera systems and AI technology could be used in the future as well (Gronskyte et al., 2015). Injured or sick animals must be identified during unloading and treated accordingly. Severely injured animals must be killed or slaughtered immediately right where they are (Anonymous, 2017), which may mean on the transport vehicle or in the unloading area. Sick animals that are still able to be transported to the slaughterhouse should be separated immediately and given appropriate care. If recovery is not possible, they must be slaughtered without delay (Anonymous, 2017).

5.1 Environment

Affected welfare domains:	Physical environment
Affected AWI (related to the aWISH project):	Skin lesions, Vocalisation

Unfamiliar objects, distractions and suboptimal raceways can impede the driving of pigs from the pen to the transport vehicle as well as out of the vehicle. Optimising the environment not only leads to a quicker and smoother loading or unloading process but also reduces stress for both the animals as well as the handling personnel.

Best Practices

- The vehicle should be **parked in the shade**, or shade needs to be provided in the loading area.
- **Moving distances must be kept as short as possible**.
- The floors as well as the ramps must be **non-slip, watertight and stable**.



- **Steps should be removed**. Remaining steps should not exceed **15cm** in height.
- To ensure a smooth flow of pigs through the alley, **90° corners should be avoided** because they can be perceived as a dead end by pigs. There should be **no blind corners** in the raceway.
- If available: a **hydraulic lift** should be used instead of a ramp.
- If ramps need to be used: ramps should not be steeper than 20° (36.4% slope relative to the horizontal plane), better **11° or 20%**.
- The ramps must be equipped with **crossbars** so that the animals have a secure footing when going up and down.
- **Gaps** between the vehicle and the ramp must be **covered**.
- **Sidewalls/safety railings** must be installed to keep the pigs from falling down from the ramp and to prevent escaping to the sides.
- The raceway should be **checked for distractions** such as light reflections, dark entrances, dead ends, loose objects and air currents. These need to be minimised as much as possible.
- **Side boards** should be available to further avoid distractions.
- The ramps and all equipment used for loading and unloading pigs must be **easy to clean and disinfect.**

5.2 Moving/driving of pigs

Affected welfare domains:	Behavioural Interactions, Mental state
Affected AWI (related to the aWISH project):	Skin lesions, Vocalisation

All persons involved in the moving of pigs should undergo training on animal welfare non-aversive handling methods. All Best Practices listed in chapter 4 “Handling” apply to the moving of pigs for loading and unloading. For a detailed list of Best Practices during unloading, please also note the Best Practice Guide “Pig: Slaughter”.

Best Practices

- Pigs should never be moved alone, but always in **small groups of preferably 3 – 6 pigs or a maximum of 9 pigs**.
- To drive the pigs, **voice and soft sounds** such as knocking on the driving board are gentle ways to encourage movement without touching the animals.
- Loading as well as unloading should always be done **as safe and quiet as possible** to reduce stress for the animals.



- Pigs should be **unloaded from the transport vehicle immediately** after arrival, especially in extreme weather conditions to minimise heat or cold stress.
- Since pigs are curious animals, they **normally leave the vehicle by themselves** when given space and time.
- It is very important to **check the pigs for health problems and severe injuries** upon arrival.
- **Severely injured or sick individuals should not be unloaded.** Instead, humane **emergency killing** on the vehicle should be considered as soon as possible.
- To ensure safe stunning and killing of the animals, animal transporters or handlers should be **fully trained to carry out emergency killing**. For more information about unfit animals, check chapter **3 "Fitness for transport"**.

5.3 Grouping on the vehicle

Affected welfare domains:	Behavioural Interactions, Mental state
Affected AWI (related to the aWISH project):	Tail/Ear lesions, Skin lesions, Vocalisation

The grouping strategy of the pigs on the transport vehicle is important to minimise stress and aggressive encounters between the animals.

Best Practices

- Pigs should be **separated according to age and origin**, and **sexually mature males should be separated from females**.
- Animals of **different species** must be kept **separate**.
- It is advised to **avoid mixing unfamiliar pigs**, e.g. from different barns or pens.
- National and EU-wide **regulations** regarding stocking density and group size on the transport vehicle must be followed.
- **Aggressive individuals should be separated from other pigs**. This can be achieved using **partitions or gates** or by isolating them in a dedicated pen, if necessary.
- The transport vehicle should also offer **enough space and/ or hiding places** for pigs to escape more dominant individuals. Hiding places include partitions and half walls that pigs can hide behind.



5.4 Stocking density

Affected welfare domains: Physical environment, Behavioural interactions

Affected AWI (related to the aWISH project): Tail/Ear lesions, Skin lesions, Vocalisation

The stocking density on the transport vehicle needs to be in accordance with EU and national legislations. However, to achieve the optimal stocking density for pigs, it is advised to **consult the latest updated EFSA opinion** (EFSA AHAW Panel et al., 2022) on the welfare of pigs during transport.

Best Practices

- **All pigs must be able to lie down and stand up**. There should also be enough space in order for **no animal to step on a lying one**. For this lateral recumbency measure, the pig's back height and size are important.
- The stocking density and the placement of the drinkers on the transport vehicle must be arranged so that **every pig can drink water anytime** without being hindered by other animals.
- **In hot weather and long journeys, the required surface should be increased up to 20%**.
- Providing **more space than recommended** by EU legislation and EFSA may cause **physical stress** due to the risk of being thrown around and getting struck as a result of unexpected and sudden movements of the truck. Fighting may also occur due to the greater freedom to move.
- **Transport duration** should also be considered when adjusting the stocking density. A **lower stocking density** should be used **for long distance transports**, whereas for short transports (2-3 hours) the negative effects of a low stocking density could overcome the positive ones (more disturbance and aggression due to animals being able to move around, loss of balance and greater risk of being thrown around).



6 Climate on transport

Affected welfare domains: Physical environment, Health, Mental state

Affected AWI: Not applicable

Factual background

High temperature during transport is considered one of the greatest contributors to transport losses (Faucitano and Goumon, 2018). Since pigs have limited abilities to thermoregulate and are unable to sweat, heat stress can become an important problem. Especially on a transport vehicle, pigs may not have sufficient access to water and wallows, and the number of pigs in a small space can further complicate climatic conditions. However, very cold temperatures in winter can also pose a challenge and negatively impact animal welfare (Faucitano and Goumon, 2018). Regarding vehicle equipment and temperature monitoring, all requirements of EU Regulation 1/2005 must be followed.

Best Practices

- Before the transport starts, the **expected weather conditions** and temperatures along the route must be **checked**. If high temperatures (> 25°C) are expected, transport should not take place, or it should be limited to a very short period (<4 hours) or postponed until the cooler hours of the night.
- **Adequate fresh air supply** must be ensured (ventilation system) so that the animals' needs are fully met, taking into account the number of animals to be transported and the expected weather conditions during transport.
- **Climate-controlled vehicles** should be used, especially for **vulnerable animals** such as weaned piglets.
- The **temperature in the vehicle must be monitored continuously** and adjusted if necessary. An alarm system must indicate critical temperatures (e.g. higher than 30°C and lower than 5°C).
- The vehicle must be equipped in such a way that **ventilation continues to function even during extended periods of standstill** (e.g. at the border) and when the engine is turned off.
- **Openings along the vehicle at pig height** can further improve ventilation. These openings should be **open in hot weather** and **partially or fully closed in cold weather**. If possible, the openings should be adjusted to the height of the pigs.
- It is important to adjust the deck height to the pigs: **the overhead space should be at least 30cm above the highest point of the largest pig** to ensure effective ventilation and a comfortable unimpeded posture of the pigs.



- Not only hot weather but also cold temperatures can decrease pig comfort. For cold temperatures and young pigs, **bedding** needs to be supplied. Furthermore, **insulation** should be ensured by covering the trailers.
- To avoid cold stress, **transport should be avoided when outdoor temperatures fall below 5° C**. Since this is not always possible, a focus should be put on **improving ventilation and/or heating** on the transport vehicles.
- When temperatures **exceed 23° C**, corrective actions need to be taken to ensure that pigs can stay in their thermoneutral zone. Prior to starting the journey, it can help to use **water sprinklers for five minutes**. However, it is important to use **high water pressure, small nozzles and very fine mist combined with good ventilation** in order to cool down the pigs without risking cold stress through wet pigs. **Water sprinkling and fans** can also be used during transport; here, the same rules apply.
- To improve ventilation and reduce heat stress, **lowering the stocking density by up to 20%** or increasing space allowance can help.
- Regardless of the weather conditions, all pigs need to have **continuous access to water during the journey**. **Drinkers** have to be installed at an **appropriate height and angle**, there has to be **enough space** for the pigs to access the drinkers, and it should be ensured prior to the journey that there is **sufficient water in the vehicle tanks**.

7 The transport vehicle and journey

Factual background

To ensure animal welfare during transport, an appropriate vehicle is of crucial importance (Broom, 2019; Pilarczyk et al., 2026). Only a suitable vehicle can ensure that the pigs' needs for space, floor conditions and rest are met. Transport vehicles and their equipment should be constructed, maintained and used in such a way that injury and suffering to the animals are prevented and their safety is ensured (Pilarczyk et al., 2026) According to EU legislation**, o**nly vehicles that are approved for animal transport may be used for long-distance trips lasting more than 8 hours **(**Council Regulation (EC) No. 1/2005**)**. However, the quality of the vehicle is also of great importance for shorter transports. Vehicles such as open trailers or tippers, and other vehicles with poor ramp design or narrow loading areas are unsuitable for animal transportation (Minka and Ayo, 2009). Furthermore, the journey itself including driving style, duration and climate conditions can immensely impact the health and welfare of transported pigs. For that reason, drivers should be trained for animal transport as well as receive animal welfare training. Training also needs to be provided to other animal welfare responsible persons that are involved in the transport of animals (Wilhelmsson et al., 2022; Wilhelmsson et al., 2024).

Affected welfare domains:	Nutrition, Physical environment, Health, Behavioural interactions, Mental state
Affected AWI (related to the aWISH project):	Skin lesions, Vocalisation

7.1 Transport vehicle

Best Practices

- The vehicles must be kept in **good technical condition**. **Regular technical inspections** and maintenance are important to ensure high safety standards.
- The vehicle must provide **protection from unfavourable weather conditions**, extreme temperatures, and climatic fluctuations. The space for pigs must always be **roofed**. It is also important to prevent condensation and heat retention: the roof of the vehicle should be light-coloured and insulated.
- **Prevention of any risk of injury** resulting from the design, operation, and deterioration of the vehicle equipment must be ensured. It is important that the floor surface is non-slip, and prevents tipping, or restraining the pigs.



- The vehicle must be designed in such a way that the **pigs cannot escape and can withstand the movements** of the vehicle.
- The animals must be **accessible for monitoring and care**. There should be a **side access** to each group of animals. This is particularly important in case of emergencies and accidents.
- There must be **partition walls** that can be adjusted to accommodate different group sizes and individual space requirements. The partitions must be sufficiently sturdy to support the weight of the animals. They should be designed to be moved quickly and easily.
- An **adequate and sufficient supply of fresh air** must be ensured for the pigs being transported. A ventilation system is strongly recommended.
- The vehicle must be equipped with a **water supply system** for the animals. The type, number, and placement (height!) of the water troughs must be appropriate for the animals being transported. The drinkers must be **easily accessible** for the pigs and always functioning. Its proper functioning must be checked before transport and regularly during long distance transport.
- A **sufficient supply of feed** must be ensured, at least during resting periods. In this regard, the ratio of feeding stations to animals and the stocking density must also be taken into account. Every animal must be able to reach the feed.
- **Food should be carried in the vehicle** so that it is available when needed.
- The interior of the vehicle must be equipped with **lighting** that is essential for the care and monitoring of the animals. The lighting must not blind the animals.
- The vehicle should be equipped with a **vibration-damping suspension system**.
- The vehicle must be **easy to clean and disinfect**.
- The floor surface of the vehicle must be designed to **minimise the flow of faeces or urine**.
- Especially during long transports (>8 hours), the loading compartments must be covered with **suitable bedding material** to ensure the pigs' comfort. There must be sufficient capacity to absorb the pigs' excrements.
- The vehicle must be **marked as an animal transport vehicle**.

7.2 Management during the journey

Best Practices

- A **maximum journey duration of eight hours** is recommended to ensure that animal welfare needs are being met. Journeys should be kept **as short as possible**. **Driving should be done smoothly**. Abrupt stops, rapid acceleration and high speed in turns have to be avoided at all costs.
- Noise during transport should be minimised. A **calm environment** reduces stress levels in animals.
- Routes with **lots of traffic should be avoided** as traffic jams lead to frequent stopping and elongate the journey.
- It is important to **avoid bad road conditions**.
- During transport, the pigs must be **provided with food and water** at appropriate intervals, in accordance with EU Regulation 1/2005, and they must be **allowed to rest**. Current EU regulation determines that pigs may be transported for a maximum of 24 hours in appropriate vehicles and with continuous access to water. Then, pigs must be unloaded, fed and watered, and a resting period of 24 hours must be adhered to. However, the EFSA AHAW Panel et al. (2022) identified signs of prolonged hunger in pigs after 12 hours. It is therefore strongly recommended to keep journeys as short as possible and avoid transport times of more than 8 hours. Eurogroup for Animals (2024) further recommends continuous access to water during the journey regardless of transport times.
- **Satellite navigation systems** should always be used – not only for long distance trips to ensure the optimal route and to keep the transport duration as short as possible.
- In case animals suffer illness or injury during transport, they must be **separated from the other animals and receive first aid** as soon as possible. They should be examined and treated by a veterinarian and, to avoid unnecessary suffering, should be emergency slaughtered or euthanised if necessary.

8 References

Anonymous (2017): Consortium of the Animal Transport Guides Project (2017-rev1). Revision May 2018 'Guide to good practices for the transport of pigs'.

Averos, X., Knowles, T. G., Brown, S. N., Warriss, P. D., & Gosalvez, L. F. (2008). Factors affecting the mortality of pigs being transported to slaughter. *Veterinary Record*, *163*(13), 386–390. https://doi.org/10.1136/vr.163.13.386

Brandt, P., Aaslyng, M. D. (2025): Welfare measurements of finishing pigs on the day of slaughter :A review. Meat Science 103 (2015) 13–23. http://dx.doi.org/10.1016/j.meatsci.2014.12.004

Broom, D. M. (2005). The effects of land transport on animal welfare. *Revue Scientifique et Technique de l'OIE*, *24*(2), 683–691. https://doi.org/10.20506/rst.24.2.1605

Broom, D. M. (2019). Welfare of transported animals: welfare assessment and factors affecting welfare. In T. Grandin (Ed.), *Livestock Handling and Transport* (5 ed., pp. 12 – 29). CABI Publishing. https://doi.org/http://dx.doi.org/10.1079/9781786399151.0012

Center for Food Security and Public Health Iowa State University. (2012). *Animal Behavior and Restraint: Swine*. I. S. U. Center for Food Security and Public Health.

Consortium of the Animal Transport Guides Project. (2017). *Guide to good practices for the transport of pigs*.

COUNCIL REGULATION (EC) No 1/2005 of 22 December 2004 on the protection of animals during transport and related operations, (2005).

Cobanovic, N., Radojicic, M., Suvajdzic, B., Vasilev, D., Karabasil, N (2021): Effects of handling procedure during unloading on welfare and meat quality of market-weight pigs. 61st International Meat Industry Conference. IOP Conf. Series: Earth and Environmental Science 854 (2021) 012017. doi:10.1088/1755-1315/854/1/012017.

EFSA AHAW Panel, Nielsen, S. S., Alvarez, J., Bicout, D. J., Calistri, P., Canali, E., Drewe, J. A., Garin-Bastuji, B., Gonzales Rojas, J. L., Schmidt, C. G., Michel, V., Miranda Chueca, M. A., Padalino, B., Pasquali, P., Roberts, H. C., Spoolder, H., Stahl, K., Velarde, A., Viltrop, A.,…Herskin, M. (2022). Welfare of pigs during transport. *EFSA Journal*, *20*(9), e07445. https://doi.org/10.2903/j.efsa.2022.7445

EFSA AHAW Panel, Nielsen, S. S., Alvarez, J., Bicout, D. J., Calistri, P., Depner, K., Drewe, J. A., Garin-Bastuji, B., Gonzales Rojas, J. L., Gortazar Schmidt, C., Michel, V., Miranda Chueca, M. A., Roberts, H. C., Sihvonen, L. H., Spoolder, H., Stahl, K., Viltrop, A., Winckler, C., Candiani, D.,…Velarde, A. (2020). Welfare of pigs at slaughter. *EFSA Journal*, *18*(6), e06148. https://doi.org/10.2903/j.efsa.2020.6148

E-learning training materials to improve animal welfare during the transport and slaughter of cattle and pigs. (2023). Institut für Veterinär-Epidemiologie und Biometrie, Freie Universität Berlin.

EURCAW Pigs, Herskin, M. S., Gerritzen, M. A., Marahrens, M., Bracke, M. B. M., & Spoolder, H. A. M. (2021). *Review of fitness for transport of pigs*. The European Union Reference Centre for Animal Welfare Pigs (EURCAW-Pigs). https://edepot.wur.nl/546057

Eurogroup for Animals. (2024). *Transport regulation: Due time to change the rules: White paper on the revision of Council Regulation (EC) 1/2005*. https://www.eurogroupforanimals.org/files/eurogroupforanimals/2024-06/2024_06_efa_MAY%20UPDATE_live%20animal%20transport%20due%20time%20to%20change%20the%20rules_white%20paper_eng.pdf

Eurogroup for Animals, UECBV, Animals' Angels, Cooperl Arc Atlantique, Copa-Cogeca, ELT, FVE, IRU, INAPORC, & IFIP. (2015). *Practical Guidelines to Assess Fitness for Transport of Pigs*. https://medlem.nortura.no/getfile.php/13300729-1472130714/Nortura%20Medlem/medlem.gilde.no/Filer/2016/Guidelines%20to%20Assess%20Fitness%20for%20transport%20of%20pigs.pdf

Eyes on animals. (2024). *Seeing your slaughterhouse through the eyes of a pig. Tips on how to reduce stress, suffering, and ease handling.*

Faucitano, L., & Goumon, S. (2018). Transport of pigs to slaughter and associated handling. In *Advances in pig welfare* (pp. 261-293). Woodhead Publishing. https://doi.org/10.1016/B978-0-08-101012-9.00009-5

Gerritzen, M. A., Hindle, V. A., Steinkamp, K., Reimert, H. G., van der Werf, J. T., & Marahrens, M. (2013). The effect of reduced loading density on pig welfare during long distance transport. *Animal*, *7*(11), 1849–1857. https://doi.org/10.1017/S1751731113001523

Gonzalez, L. A., Schwartzkopf-Genswein, K. S., Bryan, M., Silasi, R., & Brown, F. (2012). Relationships between transport conditions and welfare outcomes during commercial long haul transport of cattle in North America. *Journal of Animal Science*, *90*(10), 3640–3651. https://doi.org/10.2527/jas.2011-4796

Grandin, T. (2015). Welfare During Transport of Livestock and Poultry. In T. Grandin (Ed.), *Improving Animal Welfare* (2 ed., pp. 222 – 246). CAB International.

Gronskyte, R., Clemmensen,L.H., Hviid, M.S., Kulahci, M., (2015): Pig herd monitoring and undesirable tripping and stepping prevention. Computers and Electronics in Agriculture 119, 51-60, https://doi.org/10.1016/j.compag.2015.09.021.

Hemsworth, P. H., & Wilhelmsson, S. (2024). Behavioural principles of pig handling. In T. Grandin (Ed.), *Livestock handling and transport* (6th ed., pp. 337–356). CABI. https://doi.org/10.1079/9781800625136.0016

Holmes, R., Gerritzen, M. A., Herskin, M., Schwarzlose, I., & Ruis, M. A. W. (2020). Review on arrival and lairage management at pig slaughterhouses. *EURCAW Pigs*.

Isbrandt, R., Wiegard, M., Meemken, D., & Langkabel, N. (2022). Impact of Procedures and Human-Animal Interactions during Transport and Slaughter on Animal Welfare of Pigs: A Systematic Literature Review. *Animals*, *12*(23). https://doi.org/10.3390/ani12233391

ITAVI. *Bonnes pratiques pour le transport de volailles*. ITAVI.

Lipovšek M., Kirbiš A., Tomažič I., Dovč A., Križman M. (2024): Farm Animal Welfare during Transport and at the Slaughterhouse: Perceptions of Slaughterhouse Employees, Livestock Drivers, and Veterinarians. Animals 2024 Jan 29;14(3):443. doi: 10.3390/ani14030443.

Mellor, D. J., Beausoleil, N. J., Littlewood, K. E., McLean, A. N., McGreevy, P. D., Jones, B., & Wilkins, C. (2020). The 2020 Five Domains Model: Including Human–Animal Interactions in Assessments of Animal Welfare. *Animals (Basel)*, *10*(10), 1870.

Minka, N. S., & Ayo, J. O. (2009). Physiological responses of food animals to road transportation stress. *African Journal of Biotechnology*, *8*(25), 7415-7427.

Miranda-de la Lama, G. C., Villarroel, M., & Maria, G. A. (2014). Livestock transport from the perspective of the pre-slaughter logistic chain: a review. *Meat Science*, *98*(1), 9–20. https://doi.org/10.1016/j.meatsci.2014.04.005

Pilarczyk, M., & Ulewicz, R. (2026). Road Transport of Live Animals in the EU: Challenges in Worker Safety and Animal Welfare. *Transportation Research Procedia*, *93*, 31-36. https://doi.org/10.1016/j.trpro.2025.11.006

Schwartzkopf-Genswein, K. S., Faucitano, L., Dadgar, S., Shand, P., Gonzalez, L. A., & Crowe, T. G. (2012). Road transport of cattle, swine and poultry in North America and its impact on animal welfare, carcass and meat quality: a review. *Meat Science*, *92*(3), 227–243. https://doi.org/10.1016/j.meatsci.2012.04.010

Schrøder-Petersen, D.L. , Støier, S., & Hansen, C. (2026): The benefits and societal importance of pig welfare in slaughterhouses a narrative review. *Meat Science*, 233, 110004. https://doi.org/10.1016/j.meatsci.2025.110004

Villa, P. D., Marahrens, M., Domingo, M., Calvo, A. V., Di Nardo, A., Dalmau, A., Kleinschmidt, N., Alvarez, C. F., Truar, A., Di Fede, E., Otero, J. L., & Müller-Graf, C. (2009). *Project to develop Animal Welfare Risk Assessment Guidelines on Transport.* EFSA.

Wilhelmsson, S. (2022). *There's no time to rush! Pigs' and transport drivers' welfare and interactions during slaughter transport* (Doctoral thesis, Swedish University of Agricultural Sciences). Acta Universitatis Agriculturae Sueciae (2022:34). https://pub.epsilon.slu.se/27923/
Wilhelmsson, S., Hemsworth, P. H., Andersson, M., Yngvesson, J., Hemsworth, L., & Hultgren, J. (2024). Training of transport drivers improves their handling of pigs during loading for transport to slaughter. *animal*, *18*(4), 101115.

WOAH. (2011). *Transport of Animals by Land* (Terrestrial Animal Health Code, Issue. WOAH.

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