

HOW CLEAN IS A PIG TRANSPORT TRUCK?

A field study on hygiene in lorries within the pig supply chain.

Livestock transport is an essential part of pig farming. Animals are transported daily between farms and between farms and abattoirs. As such, pig transport poses a risk of spreading pig diseases. Although most pig farms place great emphasis on hygiene measures on the farm, transport often appears to be a blind spot. To determine how clean a pig truck actually is when leaving the abattoir, Ghent University conducted a field study. The results provide a realistic insight into daily practice and form an important starting point for necessary improvements in the sector.

A look behind the scenes of the field trial

How were samples taken?

During the study, fifteen pig lorries were examined in detail. Specific areas on each vehicle were sampled, both before cleaning and after the disinfection carried out by the driver. The cab, the exterior of the truck and all areas with which animals come into direct contact were included in the study. This approach allows for an accurate picture of the bacterial load before and after cleaning and disinfection. The measured bacterial load is an indicator of the extent of the potential presence of pathogens.

Aim of the study

This study examines the extent to which current cleaning and disinfection procedures are sufficiently effective. In particular, it looked at the total quantity of aerobic bacteria and Gram-negative bacteria, which are good indicators of manure contamination. In addition, a further analysis was carried out to determine which bacteria remain present after cleaning and disinfection.

Where is the pollution most concentrated?

The cabin: overlooked but crucial

The truck's cab proved to be a notable risk area. Although this part of the truck has no direct contact with animals, it does serve as the driver's daily workspace and is therefore a key link in biosecurity. On average, it was found that the cab had a higher bacterial load after the cleaning process than before. This means that the cleaning was not only inadequate but actually caused further spread of bacteria. After all, drivers did not pay attention to the cab during cleaning, meaning these areas remained contaminated or became further contaminated when they got in. The increased presence of Gram-negative bacteria in the cab indicates that manure residues were brought in via shoes or clothing. This is a further reason never to allow livestock transport drivers access to your premises without first changing their footwear and clothing and washing their hands thoroughly.

The exterior: limited progress

The exterior of the truck was also carefully analysed. The wheels, the undercarriage and the exterior of the tail lift were found to contain a significant amount of bacteria even before cleaning.

Although the wheels and the exterior of the tail lift showed a lower bacterial load after cleaning, this reduction was insufficient to constitute effective cleaning. The undercarriage of the truck, on the other hand, showed a higher bacterial load after cleaning and disinfection. This may be due to splashing cleaning water during the cleaning process. These results therefore demonstrate that current methods are insufficient for effectively cleaning and disinfecting the exterior.

The cargo area: the most attention, the most dirt

The areas with which the pigs come into direct contact, such as the floor, walls and inside of the loading ramp, were cleaned most thoroughly of all the locations. Yet even after cleaning, these areas continued to show the highest bacterial load. The total number of aerobic bacteria fell significantly following cleaning and disinfection, but the remaining count was still reasonably high. Gram-negative bacteria proved to be persistent, demonstrating that the removal of manure residues and organic material was insufficient, even though the lorries looked visually clean on the inside, as shown in Figure 1. Despite the clean appearance, manure residues still appear to be present in the truck. This result is in line with previous research in other countries where it has already been demonstrated that a visual assessment of a truck does not provide a reliable indication of its hygienic condition. A surface that looks clean may still contain significant amounts of biological residues. There is therefore a need for objective tools to help drivers assess whether a vehicle has actually been sufficiently cleaned and disinfected.



Figure 1: The cargo hold before and after cleaning and disinfection. (Pictures: Laura Courtens)

What does the bacterial composition of a pig truck tell us?

Analysis via 16S rRNA sequencing

Genetic analysis of the bacteria remaining after cleaning and disinfection shows that it is primarily bacterial groups typically found in the pig environment that persist. Various bacterial species normally found in the intestines or manure of pigs could still be detected on the surfaces of the load compartment. This analysis confirms that lorries carry traces of intestinal and manure-borne pathogens from pigs to the next farm.

What do these findings mean for pig farmers?

Transport is a critical link in biosecurity

The results of the study clearly show that current cleaning and disinfection practices in pig transport are often inadequate. This makes transport a significant, yet often underestimated, route for the introduction of pathogens onto pig farms. Fortunately, farmers can take a number of targeted measures themselves to reduce this risk!

What can pig farmers do themselves?

One of the most effective ways to reduce the introduction of pathogens via livestock transport is to create a clearly demarcated loading area on the farm. This is a place where the truck can load and unload without the vehicle having to enter the farm's clean zone. The loading area is functionally linked to the hygienically controlled (clean) zone of the farmyard, but remains physically separate from it. After each loading or unloading, this zone must be cleaned and disinfected by the farmer, so that any remaining dirt or contaminated material does not pose a risk to the rest of the farm. Figure 1 provides an overview of a pig farm, with the loading area marked as the red 'loading area'. A separate access route ('dirty road') to this loading area, also located outside the clean zone of the farm, further reduces the risk of contamination being introduced.

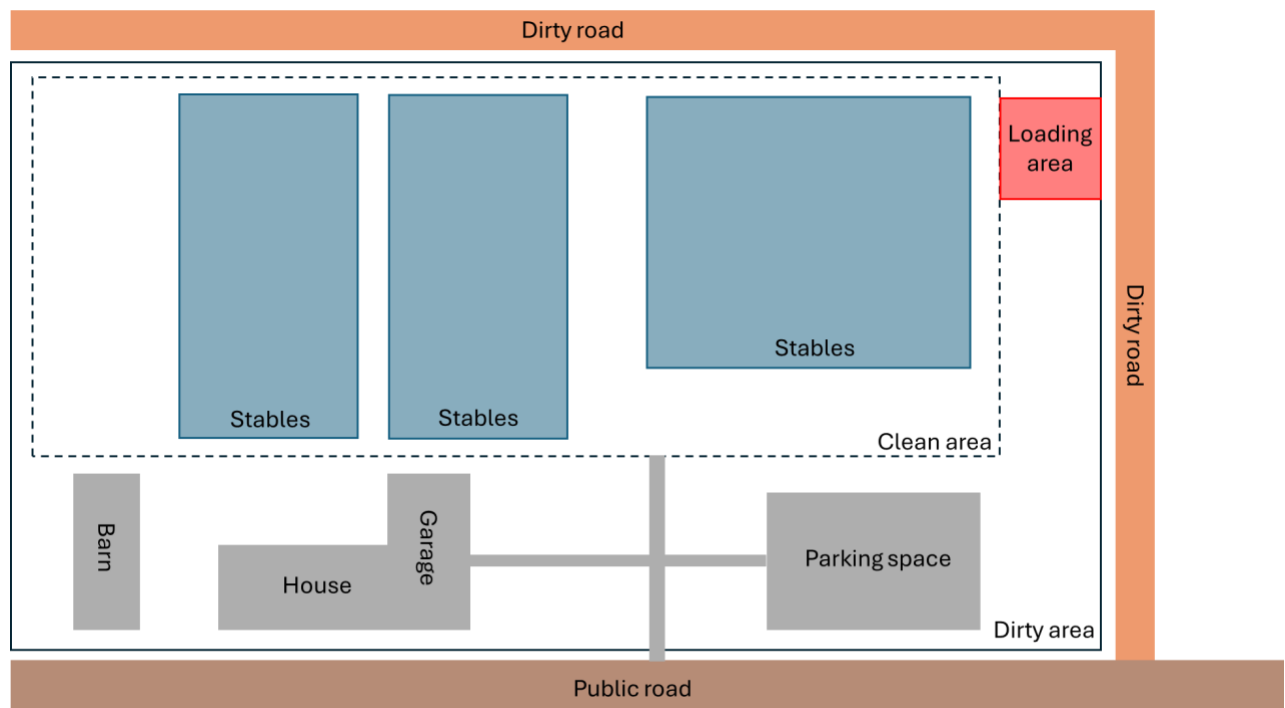


Figure 1: Floor plan of a livestock farm. (Figure: Laura Courtens)

It also helps considerably if the transport vehicle is empty, as thoroughly cleaned and disinfected as possible, and dry upon arrival. Drivers usually have a disinfection logbook in which the date and the disinfection product used are recorded. It is advisable to actively ask to see this, as it provides greater certainty regarding the vehicle's cleanliness. If necessary, additional disinfection can be carried out at the company's premises to further reduce the risk.

It is also important to ensure that the driver cannot enter the clean area of the premises. Where this is nevertheless required for practical reasons, for example when assisting during loading, it is important that the driver follows the same biosecurity measures as other visitors. This includes wearing the farm's own clothing and footwear, washing hands and keeping contact with animals and equipment to a minimum. It is important that pigs do not return to the pens after loading, as they may introduce pathogens into the farm through contact with the transport vehicle. Outgoing animals should therefore be taken directly to a clearly demarcated loading area, preferably located as far away from the pens as possible. By consistently applying these measures, the farmer can significantly reduce the introduction of pathogens via transport.

Conclusion

The field study makes it clear that pig lorries, even after cleaning and disinfection, often still harbour significant bacterial contamination. This demonstrates that current cleaning practices in abattoirs are insufficient to limit the risk of pathogens being introduced into pig farms. Furthermore, the visual impression of 'clean' appears not to be a reliable indicator: even when a load compartment looks clean, manure residues and micro-organisms often remain present.

The results underscore that both improved cleaning and disinfection protocols for lorries and additional measures on the farm are necessary to reduce this risk. The study therefore highlights not only where things are currently going wrong, but also where the practical opportunities lie for improving biosecurity in the pig supply chain.

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