

Importance of boot hygiene in livestock farming

The biosecurity risk on a farm is determined not only by the severity of a potential contamination, but also by the frequency with which a risky activity takes place. Daily routine tasks, however minor they may seem, can become a critical factor in the spread of disease due to their repetitive nature. Boots are a prime example of this: they are constantly being taken from outside to inside and through different barn areas and age categories. This means that on a daily basis they represent a potential means of transmission for pathogens and operational problems, which is why boot hygiene is anything but a minor detail.

Boots as a means of transmitting disease

Manure, litter, and moisture adhere to the surface of boots, providing a breeding ground for millions of pathogens. Bacteria such as *Salmonella* and *E. coli*, as well as viruses such as African swine fever and avian influenza, can be transferred from one farm or compartment to another via boots. Field research shows that simple manure particles on soles can remain infectious for hours or even days. This makes boots, precisely because of their continuous use, an important factor in the chain of within-farm transmission.

Biosecurity starts at the door

Biosecurity plans often describe broad principles such as quarantine upon arrival, vaccination schedules, or pest control. However, hygienic footwear is often the first and simplest barrier. Separating “dirty” and “clean” zones is fundamental in this regard. This can be achieved, for example, by setting up a hygiene lock where every employee and visitor is required to change into work boots before entering the stables. It is also best to change boots between animal groups or compartments within a farm. By providing fixed boots for each stable or compartment, mutual contamination routes are minimized.

Pitfalls and practical advice

Even for experienced livestock farmers, boot hygiene can sometimes be a challenge, precisely because routines quickly become ingrained and conditions on the farm are not the same every day. It is essential to remember that boots must always be cleaned before they are disinfected. Manure and dirt form a protective layer around pathogens, which means that the disinfectant can hardly do its job. Stepping directly into a disinfection bath without cleaning the boots first has little effect and also causes the bath to become contaminated more quickly, reducing the effectiveness of the disinfection with each passage and requiring the bath to be changed more regularly. A rule of thumb is that boots should be cleaned until they are visibly clean, so that there is no dirt left that could inhibit the effectiveness of the disinfectant. Cleaning is best done with a detergent. This can be done with a brush, a boot washer, or a high-pressure cleaner. However, when using the latter, care must be taken to ensure that the manure is not spread too far into the surrounding area, which can lead to additional contamination risks.

Even better than disinfection baths is the use of farm-specific boots. These boots help prevent pathogens from outside entering the farm. Consistency is essential for strong biosecurity: farm-specific boots must therefore be used consistently by every visitor to effectively limit the risk of introduction.

In addition to farm-specific boots, emphasis is placed on stable/compartment-specific boots. This means that each compartment or age group has its own set of boots, which limits the transfer of pathogens within the farm as much as possible. These stable-specific boots must be cleaned at regular intervals, for example at the end of each day, followed by thorough disinfection, ensuring sufficient contact time with the disinfectant. Only then can the disinfectant really do its job and effectively kill pathogens. This regular cleaning and disinfection prevents the accumulation of manure and dirt, which improves the effectiveness of the disinfection. At the same time, working with stable-specific boots saves time and effort. Because the boots are used per stable, it is no longer necessary to clean and disinfect intensively every time you move between stables or compartments. In that case, these activities can be concentrated at the end of the day without compromising biosecurity. This makes it easier for everyone on the farm to consistently apply good hygiene and prevents time pressure from leading to mistakes.

Visual recognition and special zones

For larger farms with multiple employees, it is very useful to use boots in different colors. This visual recognition makes it immediately clear to everyone which boots belong to which stable, further reducing the risk of misuse and cross-contamination. It also helps to improve the organization of biosecurity routines and makes switching between zones efficient and clear.

In addition, the use of boots plays a crucial role in stables where extra biosecurity is required, such as isolation and quarantine stables. These areas are best physically separated to prevent pathogens from spreading to healthy animals. In such stables, separate, strictly assigned boots are absolutely necessary. Visitors and employees should only use these boots within these specific zones and strictly avoid wearing them elsewhere. This ensures that any pathogens are not carried to other parts of the farm, which is essential for managing animal diseases and protecting overall farm health.

Discipline and support

Discipline in repetition is the key to successful boot hygiene: it is mainly about working together to establish good habits on a daily basis. Everyone at the farm plays an important role in this, from permanent employees to visitors. Clear agreements, clear visual recognition of clean and dirty zones in the hygiene lock, and regular review and evaluation of the feasibility and convenience of the routines help to make them natural and self-evident. It is precisely because boot hygiene is performed many times a day that consistent behavior is so powerful. With the right support, practical habits are created that enhance biosecurity, and the routines remain not only effective but also workable for everyone at the farm.

Benefits of good boot hygiene for the company

Healthy animals are less susceptible to disease and develop better. This results in lower mortality rates and more uniform herds, which simplifies management and maximizes yield. Because sick animals grow less well and require more frequent treatment, preventing disease also leads to more efficient farm operations.

A clear economic advantage is that fewer animal diseases reduce the use of antibiotics. This means lower medication and veterinary costs, which results in direct savings on operating costs. In addition, a healthy animal population ensures lower feed conversion, which reduces feed costs. Fewer diseases and losses also mean less labor-intensive care and maintenance, which can further reduce labor costs.

In addition, good hygiene improves animal welfare because the animals experience less stress and live in a healthier environment. Better animal health not only increases the animals' lifespan, but also prevents damage costs and economic losses due to quarantine, culling, or production losses in the event of outbreaks. All of this contributes to stable and sustainable business operations.

Conclusion

Boots may seem like a minor part of farm life, but they play a major role in biosecurity. Precisely because of the high frequency of contact, they exchange risks between farm environments countless times a day. Through clear protocols, infrastructure, and above all daily discipline, boot hygiene becomes one of the most powerful weapons against the introduction and spread of disease.

This work was funded by the European Union under the Horizon Europe grant 101083923 (BIOSECURE). Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.