

Control strategies: Biosecurity



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Highlights

One of the goals that any PRRSV control programme in breeders must pursue is minimising the contact with the virus, whether it is the resident virus on the farm, which may circulate among the growing animals or new virus strains that may enter the farm from the outside.

The first source of the virus for the breeders is the replacement gilts, hence the importance of respecting long enough isolation periods after the infection so the gilts have eliminated the carrier status when they enter the production stage.

The internal biosecurity guidelines must include all the measures aimed at minimising or eliminating the circulation of the virus in the growing animals, including guidelines that limit the movements and the handling of the piglets in the lactation stage, the mixing of animals from different age groups and the use of equipment shared between batches, as well as establishing appropriate cleaning, disinfection and sanitary/production breaks programmes.

The most probable source of new virus strains that come from outside the farm are the replacement gilts. Due to this, it is essential to guarantee the negative origin of the animals, to establish appropriate quarantine programmes and to carry out the tests that allow confirming the negative status of the gilts when entering the farm.

Lorries are an important source of virus, and it has been shown that the animals loaded in contaminated trucks can become easily infected, and that the cleaning and disinfection programmes applied routinely, may not be sufficient for eliminating the contamination from the vehicles.

The spreading of the virus is successfully limited with the implementation of measures such as the shower and the change of clothes of the people when entering the farm. Nevertheless, the equipment that enters the farm, including the maintenance staff tools among others, may entail an important risk if cleaning and disinfection guidelines for these materials are not implemented.

The airborne transmission of the virus, although controversial, may play a role in the entrance of new strains into a farm, the location of new farms in isolated areas and the building of physical barriers on the already built farms being recommendable.

In the programmes for the breeders' control of the infection, one of the goals that must be pursued is to achieve a high average immunity level in the population through the adjustment of the replacement gilts and the vaccination of the sows. Nevertheless, the minimisation of the contact of the animals with the virus is important, whether it is a virus that is residing on the farm and that may circulate among the growing animals, the replacement gilts or other sows in the production stage on unstable farms, or new strains of the virus that may reach the farms from the outside. Therefore, any programme for the control of the infection on a farm must include the implementation of internal and external biosecurity procedures that allow reducing, significantly, the risk of the contact with the virus.

The internal biosecurity's main goal is to avoid the contact of the sows, even though they are immunised, with the virus that may circulate on the farm. The first source of the virus for the breeders is the replacement gilts, hence the importance of respecting isolation periods after the infection, that are sufficiently long, so by the time the gilts have entered the production stage they have already gotten rid of the carrier status. This must be confirmed through tests. We must also establish specific management measures that guarantee the isolation of the replacement gilts from the rest of the sows, that include the housing in buildings, or at least rooms, that are independent from the rest of the farm, the use of specific equipment for these areas and the changing of clothes of the staff in charge of looking after these animals.

Internal biosecurity must also include procedures that avoid possible viruses from circulating among other age groups, especially among growing animals, reaches the breeders. The most effective measure is limiting or even stopping the circulation of viruses in the growing animals. Therefore, it is essential to minimise the contact between infected and susceptible animals. The first control measure must be aimed at limiting, as much as possible, the mixing of piglets between different litters, because if any litter is born infected, the mixings will facilitate immensely the transmission of the virus among all the farrowing batch. For the same reason, we must minimise as much as possible the handling management procedures routine carried out during the lactation period, such as castrations or the clipping of teeth. It is really important to avoid the contact between animals of different ages or batches, even crossing through the same corridor, especially if it has not been cleaned and disinfected. After the weaning, the mixing of piglets from different batches must be avoided at all costs, working in a strict All-In-All-Out system. The success of the measures previously mentioned will be supported by the correct movements of the staff within the farm, avoiding the handling of younger animals after having well-cared-for older animals, using a specific equipment for each

area on the farm, and implementing the appropriate cleaning, disinfection and sanitary/production break programmes on the facilities.

Finally, in terms of internal biosecurity, it is important to underline that the iatrogenic transmission of the virus has been described. Therefore, the use of reusable syringes and needles shared in the treatment and/or the vaccination of the animals entails a risk for the spreading of the virus. As a consequence, it is recommended to make a frequent change of needles when administering systematic treatments or vaccines, avoiding the use of the same needle for different litters or different pens after the weaning. Alternatively, the needle-free systems that are currently being developed can be used to avoid this risk.

On the other hand, it is very important to implement all the measures available to avoid the entrance of new strains on the farm, because although the animals have immunity, it is possible that it is not enough to protect them against infections with heterologous strains. In this sense, we must underline, once more, that the entrance of infected animals entails the highest risk, probably followed by the contact of the animals with infected equipment and, to a lesser degree, the airborne spreading of the virus.

Therefore the first measure that we will have to implement is the purchase of replacement gilts negative to the virus. Although in the past it was common to buy positive gilts because it was thought that they would possess immunity and that they would be protected against the infection, currently this practice is considered risky, because it is very probable that the positive gilts are virus carriers. The Biosecurity program of the farm must include the control of the replacement gilts, through the determination of viraemia and serological analysis, to guarantee its status. These tests must be carried out at the beginning and at the end of the quarantine period. In this sense, the quarantine system must ensure that the animals are isolated for a period of time long enough so as to assure that they did not come infected from their source site or on their way to the farm.

Another risk, considered important, is the contamination of the lorries, because it has been shown that if susceptible animals are loaded in a contaminated truck, they become infected easily. On the other hand, it has been confirmed that it is possible that the virus persists in the contaminated vehicles after their cleaning and disinfection, if this has not been performed correctly, it is easy to deduce that the use of vehicles for the transportation of animals that have not been cleaned and disinfected properly entails a far from negligible risk. To minimise the risk, we must require that the lorries that transport replacement sows are only used for the transportation of this kind of animals and, that in the case of production systems that share positive and negative farms, the movements from the negative farms are

always carried out after a resting period of the lories, and always after following an appropriate cleaning and disinfection protocol. Finally, and regarding the transportation, we must bear in mind that the entrance of vehicles for the removal of the culled sows also entails a considerable risk, because this kind of transportation frequently follow an itinerary through different farms, loading animals from different origins and with different health status.

We must also avoid the contact of the animals with any person or materials that may be contaminated. The compulsory shower and change of clothes when entering the farm would be enough to avoid the risk. Nevertheless, for caution's sake, a resting period is usually required before visiting negative farms. However, people cause a lower risk than that posed by the potentially contaminated equipment, as for instance the maintenance staff tools. Due to this it is especially important to have a system that allows the disinfection of all the external materials or of the materials shared with other farms that must be introduced in the farm, especially if it has to come into a direct or indirect contact with the animals.

The semen doses deserve a special mention. The virus may be shed in the ejaculate, and it can contaminate the semen doses prepared with those ejaculates, and the virus is infective via the genital route. Since the virus dose needed to cause the infection through this route is higher than in the case of other routes and the amount of virus that can be found in the semen is relatively low, the venereal transmission does not always happen. Nevertheless, there are many verified infection cases due to the introduction of contaminated semen doses. Therefore, the certification of the semen doses as being free of viruses is necessary in a programme for the breeders' control of the virus.

On the other hand, it has been described that flies and mosquitos can act as mechanical vectors, although they do not play a role in the biological cycle of the virus and, thus, the probability of infection through this route is low. Anyway, it is recommendable to have implemented disinfestation programmes on the farms that avoid the presence of these insects.

Finally, it is known that the airborne transmission of the virus is possible, although there are indications that PRRSV2 strains probably have elevated transmission due to their higher replication at advanced titers. Likewise, it has been demonstrated for PRRSV1 and for PRRSV2 that not all strains replicate in the nasal epithelium. Nevertheless, the existence of the possibility of the airborne transmission and the fact that on the farms located in areas with a high pig density the reinfections are more frequent than on isolated farms. It is recommendable to locate the new farms in isolated areas, and place, to the fullest extent of, physical barriers and lines of trees on already built farms. In the US, where the airborne transmission seems to play an important role, the use of air filters on the farms to prevent reinfections has become established. Their high cost would justify documenting their use in high genetic value farms where there has been cases of repeated reinfestations through this route.

References

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Main biosecurity factors to bear in mind in the control of the PRRSV circulation among the sows

