

The importance of reducing the viraemia and the excretion of the virus in sows



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Highlights

In sows, the PRRS virus infection starts with a viraemia stage that usually lasts 1-2 weeks. After, the virus persists in the lymphoid tissue for a variable period that may reach 3 months.

During the persistence stage the transmission is possible, although it is assumed that the probability is lower than in the more acute stages.

The immunised sows subject to a heterologous challenge with a strain with the same genotype always show a reduction in the period of viraemia with a virus excretion for a limited time.

The reduction in the excretion and in the infective period of the vaccinated sows helps lowering the probability of an effective contact, although currently it is not possible to specify it quantitatively.

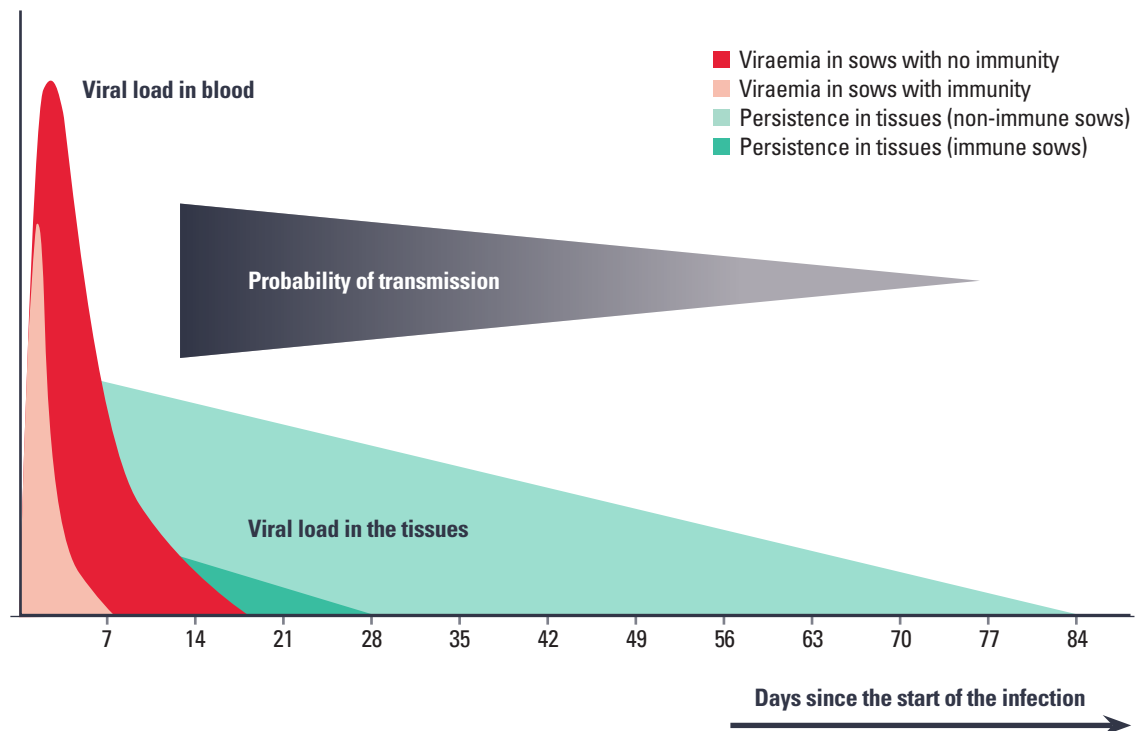
In sows, the PRRS virus infection starts with a viraemia stage that usually lasts for 1-2 weeks in the case of the genotype 1 subtype 1 strains (the ones found in Spain). During this stage, the virus can be passed on to the foetuses if the pregnancy exceeds its day 72. During the viraemia stage, the excretion of the virus in the nasal mucus is irregular, while excretion in oral fluids is much more consistent. If we observe what happens in the infected males, it is possible that the virus may be found more easily in the oral fluids on post infection days 7-14. After this stage, the virus persists in the lymphoid tissue for a variable period between animals, but it is as-

sumed that it can last for up to three months. The transmission is possible in this phase, although it is assumed that the probability is lower than in more acute stages (nevertheless, we lack clear experimental data about this). It is important to underline that although the lymphoid tissues are infected, the excretion is not necessarily constant or, at least, it may not be enough to cause infection. So, some studies have shown that the transmission is possible from non-viraemic sows to sows without immunity, although this transmission happens after a continuous contact for a relatively long period (up to more than 30 days).

Two main effects are perceived in the case of the sows that have been previously immunized: a clinical protection (decrease in the number of miscarriages, stillborn piglets and premature farrowings) and a virological protection, being both of them related. So, the sows immunized and subject to a heterologous challenge with a strain with the same genotype always show a reduction in the period of viraemia. In the case of type 1 strains, the majority of the vaccinated sows develop a short-life viraemia (5-7 days) with a very limited nasal excretion, and some sows may not even develop a viraemia. This reduction of the viraemia significantly contributes limiting the impact of the infection on reproduction, because it diminishes the probability of a transplacental transmission of the virus. Recent data (Gibert *et al.*, 2015) indicate that vaccination, besides reducing viraemia, significantly reduces virus excretion through oral fluids.

Certainly, the lower excretion and infectivity of the vaccinated sows help to reduce the probability of an effective contact. Anyhow, it is currently impossible to make an accurate quantitative assessment. This difficulty stems from different aspects. First we must bear in mind that not all sows develop the same immunity levels, so throughout the population, there will be highly protected animals (that will not contribute to the transmission) and low immunity animals that will still excrete virus at a lower level. . Secondly, the genetic diversity of the virus strains will also pose a factor of variation. Thirdly, the environmental conditions that influence a nearly close contact and development of chronic stress will be important for facilitating virus transmission and excretion.

Figure 1. Course of the infection in immune and non-immune sows.



References

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