

# Epidemiology and prevalence



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### Highlights

**First PRRS outbreaks were reported in the mid-decade of 1980 in North America, in 1988 in Japan and in 1990 in Germany. Nowadays most pig producing countries are endemically infected.**

**PRRSV1 is still predominant in Europe and PRRSV2 in the Americas. In Asia, PRRSV2 predominates but PRRSV1 is also common.**

**Introduction of the virus in a country or in a farm most often happens after the import or introduction of infected animals or semen.**

**Between farms transmission may also occur via contaminated trucks or airborne transmission, although the latter seems to be more common for PRRSV1 than for PRRSV2.**

**The virus is shed in several body fluids although the virus is most consistently found in oral fluids throughout the infectious period.**

**Transmission between animals may happen by direct contact or fights, but iatrogenic transmission through contaminated needles is important.**

**If no measures are taken, farms become endemic for PRRSV suffering periodic outbreaks.**

First outbreaks of PRRS were reported in USA in the mid-decade of 1980, in Europe in 1990 and in Asia, specifically in Japan, the first known outbreaks occurred in 1988 and 1991 in Taiwan. At present, all North American countries and most of the European and Asian ones are endemically infected by PRRSV. In South America, the disease has been reported in most of the countries but Argentina and Brazil are still free of the infection. Little information is available about African countries and, in the Pacific, Australia and New Zealand are free of PRRSV. PRRSV1 is predominant in Europe and PRRSV2 in the Americas. In Asia, PRRSV2 predominates but PRRSV1 isolates are common.

The infection usually enters a country by importing infected semen or animals that have not been adequately controlled. Dissemination of the infection between farms may happen by different routes. Purchase of subclinically infected gilts or boars is a major risk. It has been shown that non-viremic animals may transmit the infection to susceptible penmates for a period of almost 3 months after the onset of infection. Semen is also an important source of infection for susceptible farms. Infected boars shed the virus in semen intermittently for several weeks after viremia ceases. Trucks, particularly those transporting animals, are also an important way of dissemination of the infection. Insufficient disinfection of trucks permits the infection of loaded susceptible animals but also may contaminate clothing, boots and materials in contact. Other vehicles, such as feedstuff transport, etc. may also imply a risk. Fomites carried by people; for example, clothes and boots, material for veterinary use, etc., can also introduce the infection in the farm. Airborne transmission of the virus is well documented. However, this type of transmission seems to be dependent on the strain, probably because of a higher replication level in the animals and particularly, in the nasal mucosa. While highly virulent PRRSV2 strains are transmitted relatively easily by this route (up to several kilometres probably), less virulent PRRSV2 isolates or most of the PRRSV1 subtype 1 strains are probably not so easily transmitted by the air. Mechanical vectors such as flies are unlikely ways of transmission between farms. The likelihood of transmission by consumption of contaminated meat created a serious debate affecting meat import/export. At present, all studies done in Europe, Australia or New Zealand indicate that this risk is extremely low or even negligible in most modern pig production circumstances.

Given the systemic nature of the infection, during the viremic phase the infected animals shed the virus in the nasal secretions, oral fluids, faeces, semen, colostrum or milk, urine, etc. After viremia ceases, shedding is reduced. In any case, oral fluids is where the virus can be found more consistently throughout the infectious period. In the post-viremic phase, the virus is found in lymphoid tissue with the tonsil the last organ from where the virus disappears.

Infected animals shed the virus. Transmission between animals may happen by direct contact, most probably by the oronasal route, but also through bites during fights between pigs. Sexual transmission is possible, although in practice, the use of certified semen is enough to prevent it. Within farm transmission by needles can be important, especially when vaccines or treatments are administered during an outbreak without changing needles between animals. In maternities, needles shared between litters for iron administration are a very efficient way to transmit the infection.

Infected farms usually become endemic for PRRS if no measures are taken. Usually, most sows become infected during the first outbreak and will become immune to reinfection by the same strain. However, the combination of high replacement rates and the long duration of infection allow the virus to be transmitted to new gilts entering the farm. Beyond this, vertical transmission to the offspring continuously creates new infected populations in the farm that can be a source of infection for other animals, either by direct contact or through fomites. The average infected farm suffers new outbreaks every 1-2 years because of the increased proportion of susceptible animals (non-immune gilts) or because of the introduction of a new PRRSV strain.

### The cycle of PRRS

