

Clinical course of the PRRS virus infection



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Highlights

The reproductive infection is characterised, mainly, by miscarriages as of day 72 of pregnancy in which mummified fetuses and more or less fresh fetuses are expelled. In sows, in earlier stages of gestation miscarriages are very rare, and the infection is not related to an increase in returns-to-oestrus.

In the case of the most common Spanish PRRS virus strains, the infection in piglets is not frequently evident from a respiratory point of view, and it mainly appears as an imprecise non-specific increase in mortality, within a respiratory complex.

A sign that reveals the PRRS circulation in the nursery is the increase in Glässer's disease, bacterial pneumonia or streptococcal meningitis cases.

Genotype 2 is generally considered more virulent than type 1, although there are evidences that the type 1 strains circulating in Eastern Europe (Belarus, Lithuania, Russia, etc.) pertaining to genotypes 2, 3 and 4 could have a higher virulence.

In general, we can state that the PRRS virus strains, whether genotype 1 (PRRSV1) or 2 (PRRSV2), cause a reproductive infection that is basically characterised by miscarriages as of day 72 of gestation (with a peak around days 95 - 105 of pregnancy). Regularly, 1-2 days before the miscarriage the sow has a fever and eats less than normal. In these miscarriages, the sow expels a mix of mummified/macerated and more or less fresh fetuses. Likewise, in most of the cases, the miscarriages go together with premature farrowings of piglets with a very low viability or with farrowings with a delay of 2-3 days with regards to the expected date. When the sow's infection happens in very late pregnancy, it is possible that the birth of full

term viraemic piglets, that do not look well, occurs with a low viability. During a reproductive outbreak, the percentages of live piglets at weaning decreases dramatically for several weeks, and the mortality in the nursery can easily reach 25-30%.

On the other hand, in sows in earlier gestation stages miscarriages are rare, and if they happen, it only occurs sporadically. The infection is not related to an increase in returns-to-oestrus. In the empty sow, the clinical signs are few, and the infection often goes unnoticed. In the case of some high-virulence strains of PRRSV2, sow's mortality can also be detected; fact that is less frequent in PRRSV1 strains.

In the case of piglets, the disease is predominantly respiratory, although we must point out that the virulence of PRRSV2 strains (previously referred to as North American) is much higher than that of the PRRSV1, subtype 1 strain (the predominant one in Western Europe).

In the case of the strains more commonly seen in Spain, the infection of the piglets is not frequently obvious, and it mainly shows up through an increase, in a more or less, non-specific mortality due to a respiratory disease complex. A sign that generally, gives away the circulation of the PRRS in a nursery, is the increase in Glässer's disease, bacterial pneumonia or streptococcal meningitis cases.

In piglets with a higher weight (approximately 3-4 weeks of age), the infection symptoms often may not be that obvious, and it is not a surprise that in the farms, where these cases have been detected, it is thanks to the presence of seroconversions.

In the case of boars, there is a certain debate regarding the manifestations of the infection. We can say that in many boars, the infection with the PRRS virus will mainly be asymptomatic, and in some cases we will see alterations in the quality of the semen such as decrease in motility, acrosome alterations, etc.

Regarding the differences between genotypes, we must underline that PRRSV2 is generally considered more virulent than PRRSV1, although there are evidences that the type 1 strains circulating in Eastern Europe (Belarus, Lithuania, Russia, etc.) pertaining to subtypes 2, 3 and 4 could have a higher virulence. Among PRRSV2, we know variants with a highly virulence that up to now have only been described in China and Vietnam and that cause a high mortality (up to 25%) even in adult animals. In these cases, the clinical signs observed are different to those detected with other PRRSV strains, with the remaining possibility of finding hemorrhagic lesions in lungs, interstitial nephritis, vesicular edema and splenic infarcts, among other injuries. The genotype 2 strains with a high virulence circulates in US, Canada and Mexico, however lower than that of the hypervirulent Chinese strains.

In regards to the strains circulating in Spain, they are almost exclusively genotype 1 subtype 1. Among this group there is a certain variation in virulence, although lower than the existing between subtypes or in genotype 2. The variations in the clinical presentation seen in the field are determined, significantly, by the specific immunity status against PRRS of the infected animals, as well as by the environmental and handling/management circumstances (sows) and by the coexistence of other pathogens on the farm (piglets).

References

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Production stage	Genotype 1-subtype 1	Genotype 1-other subtypes	Genotype 2-conventional strains	Genotype 2-high virulence strains*
Empty sows	<ul style="list-style-type: none"> • Asymptomatic • Transient anorexia (1-2 days) • Transient low fever 	<ul style="list-style-type: none"> • They are supposed to be similar 	<ul style="list-style-type: none"> • Asymptomatic • Transient anorexia (1-2 days) • Transient low fever 	<ul style="list-style-type: none"> • High fever • Anorexia • Vulvar and limb hyperaemia
Pregnant sows (< 72nd day of gestation)	<ul style="list-style-type: none"> • Sporadic miscarriages 	<ul style="list-style-type: none"> • They are supposed to be similar 	<ul style="list-style-type: none"> • Sporadic miscarriages • Occasionally, death of sows 	<ul style="list-style-type: none"> • Anorexia • Vulvar and limb hyperaemia
Pregnant sows (> 72nd day of gestation)	<ul style="list-style-type: none"> • Miscarriages • Premature farrowings • Delayed farrowings • Expelling of mummified foetuses • Birth of weak piglets 	<ul style="list-style-type: none"> • They are supposed to be similar 	<ul style="list-style-type: none"> • Miscarriages • Premature farrowings • Delayed farrowings • Expelling of mummified foetuses • Birth of weak piglets • Occasionally, death of sows 	<ul style="list-style-type: none"> • Miscarriages • Vulvar and limb hyperaemia • Premature farrowings • Delayed farrowings • Mummified foetuses • Birth of weak piglets
Young piglets	<ul style="list-style-type: none"> • Delayed growth • Unspecific respiratory signs • Secondary infections 	<ul style="list-style-type: none"> • High fever (up to 42°C) • Clear dyspnea • Cough • Secondary infections 	<ul style="list-style-type: none"> • Obvious delayed growth • Intense respiratory signs • Secondary infections 	<ul style="list-style-type: none"> • High fever (up to 42°C) • Clear dyspnea • Cough • Haemorrhages • Kidney lesions • Secondary infections • High mortality (≤25%)
Fattening / Rearing of replacements (> 60-70 kg)	<ul style="list-style-type: none"> • Low fever • Occasionally, respiratory signs 	<ul style="list-style-type: none"> • Without data 	<ul style="list-style-type: none"> • Low fever • Occasionally, respiratory signs 	<ul style="list-style-type: none"> • Like in young piglets, but a little more attenuated
Boars	<ul style="list-style-type: none"> • Asymptomatic • Slight sperm alterations (acrosome, reduced motility) 	<ul style="list-style-type: none"> • Without data 	<ul style="list-style-type: none"> • Without data 	<ul style="list-style-type: none"> • Without data