The first objective in controlling PRRSv is to produce PRRSv negative (not infected) weaned pigs from sow herds. Several management strategies have been reported to assist in achieving this goal.

**Semen**

Based on the fact that PRRSv can be transmitted to sows via semen it is imperative to avoid introducing contaminated semen into the sow herd. Presently, most boar studs in the US are PRRSv negative and are routinely testing for PRRSv to detect and eliminate PRRSv from the stud should an infection occur. PRRSv may not be detected by PCR in boar serum or semen until 24 or 96 hours post-infection respectively (Reicks et al., 2006) suggesting there is a window of time that the virus will not be detected. However, serum continues to be the most sensitive sample for boar stud monitoring.

**McRebel**

McCaw (2000) introduced a new concept to control spread of pathogens in suckling pigs. The concept acronym McRebel stands for “Management Changes to Reduce Exposure to Bacteria to Eliminate Losses”. Measures such as decreasing cross-fostering to a minimum, eliminating poor doing non-responsive pigs, changing needles between litters or pens and taking extra care of the smallest pigs were included. Breeding farms that undergo a PRRSv elimination process that did not include thorough and continued McRebel management practices have had recurrent recirculation of the virus in the piglet population (Polson et al, 2010) highlighting the importance of these management practices.

**Gilt Acclimation**

Once a breeding herd has become infected with PRRSv, gilt introduction becomes one of the most important factors for PRRSv control. Gilts are susceptible to PRRSv infection and PRRSv recirculation if they have not developed protective immunity prior to introduction into the herd. Additionally, gilt introduction has an important influence on the production of PRRSv negative pigs at weaning. If gilts become viremic during the breeding period, they become a source of virus for the herd which results in transmission to the neonatal pigs. Gilts that are infected with PRRSv in their growing phase will create future breeding animals that once introduced into the breeding herd could be at least partially immune to reinfection. Therefore, the goal in a PRRSv acclimation program is to expose gilts at a young enough age to the same strain of virus that is resident in the herd into which they will be introduced such that they are immune and non-viremic before entering the breeding herd. Early in the acclimation program, gilts can be exposed to PRRSv using different
programs. One way is to expose gilts to viremic nursery pigs which may transmit the virus to the gilts. A second method is to intentionally expose incoming gilts to the resident PRRSv by live virus injection (Battista et al., 2002). Potential risks with this method are the spread of other pathogens, increased mortality and perhaps generation of PRRSv aerosols posing a risk for neighboring herds. One important advantage to this method is that the actual exposure date will be known and theoretically all gilts will develop immunity against the resident PRRSv at about the same time, thereby providing the basis for the elimination of the virus at the population level. A third acclimation option is to vaccinate gilts during the acclimation period. With this option, gilts receive one or two immunizations using a modified live vaccine prior to entering the breeding herd. The younger that gilts are vaccinated the more time they will have to mount a solid immune response and will be better prepared when field strain exposure should occur.

Vaccination

Both inactivated and modified live virus (MLV) vaccines have been used in gilts, sows and growing pigs for the control of PRRSv. MLV vaccine has shown efficacy in reducing mortality and poor growth when vaccinated pigs are exposed to the parent strain from which the vaccine had been prepared. MLV vaccines have shown efficacy in reducing disease occurrence and severity in growing pigs even when a heterologous strain was used as the challenge virus (Roof, 2008). MLV vaccine has also been administered repeatedly within infected populations and the number of persistently infected and shedding pigs was apparently reduced (Cano et al., 2007). MLV vaccines have been used to aid in the control and elimination of field virus from infected breeding herds.

Inactivated PRRSv vaccines have been reported to improve farrowing rate, return to oestrus and piglets weaned per sow in endemically infected populations (Alexopoulos et al., 2005). However, others have reported that inactivated commercial vaccines have not conferred protection when administered to gilts which were subsequently experimentally challenged (Zuckermann et al., 2007; Reicks et al., 2010).

Elimination Methods at the Herd Level

Different methods have been described for eliminating PRRSv from sow herds including test and removal, whole herd depopulation/repopulation and herd closure.

Test and Removal

Elimination of PRRSv through this method has been documented. Test and removal is based on serological testing of the breeding herd and culling seropositive animals (Dee, 2003). The main disadvantage of this method is cost of testing and cost of premature removal of positive animals from a productivity point of view. Another disadvantage is the cost of detecting unexpected positive individuals. Positive animals can be either infected or represent false positive results and thus further diagnostic investigation is needed, further increasing costs.

Whole Herd Depopulation and Repopulation

This method comprises the elimination of all breeding and / or growing swine from the farm, disinfecting the facilities and re-stocking the farm with PRRSv negative pigs. Although this method is highly effective, whole herd repopulation is costly since all the breeding females need to be replaced. An off-site breeding program can be implemented to mitigate the disruption in weaned pig production. One important advantage is that this method can also eliminate other pathogens and improve genetics simultaneously.

Herd Closure and Rollover

Herd closure and rollover has become the most widely used method for eliminating PRRSv from sow herds. This method was first described by Torremorell et al. (2003) and consists of interrupting the introduction of incoming replacement females into the breeding herd for at least 6 months plus the elimination of seropositive animals over time. The objective of stopping the introduction of new animals into the herd is to decrease the number of susceptible animals in which the pathogen can replicate, thereby favoring the elimination of the virus. In conjunction with planning for assuring availability of gilt replacement, herd clo-
sure has been reported to be the least expensive method to eliminate PRRSv. Furthermore, breeding herd performance may improve after the elimination plan has been completed. Planned exposure of the breeding herd with homologous virus or MLV vaccine as a last step before stopping the introduction of the last infected replacement animals, increases herd immunity when closure is initiated. The objective of exposing all breeding animals at once is to ensure that all sows have been exposed and had an opportunity to mount an immune response. Once all animals have mounted an immune response transmission should decrease. Although persistently infected animals may exist temporarily, if there are no susceptible animals remaining in the herd, the ability of the virus to circulate within the herd will be significantly reduced or eliminated. Following intensive testing that confirms that the herd is PRRS negative, future animal introductions must be with PRRSv negative gilts and semen to maintain the herd free of the virus.

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References


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