Efficacious control of porcine reproductive and respiratory syndrome

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Numerous serological surveys have shown that porcine reproductive and respiratory syndrome (PRRS) is present in all major pig producing countries. The economic impact has been estimated to be $560 million a year in the United States.

Unfortunately, our understanding of the epidemiology of the disease is still incomplete and, as a consequence, its control and prevention remain a challenge.

Pigs are the only species capable of becoming infected with PRRSv. Once infection occurs, the virus can persist in pigs for up to 150 days and the virus can be shed from persistently infected pigs via blood, semen, saliva, milk, colostrum, urine and faeces.

The infected sows can shed the virus to their offspring via the placenta, which is very important because this is at the beginning of the production process.

PRRSv circulation on the pig farm normally starts with replacement animals (gilts, young boars or semen) entering the farm, then the infected incoming animals will shed PRRSv to resident breeding sows or the replacement gilts will be infected from the carriers on the farm.

In the breeding herd the virus can cause abortion, stillbirths and sow deaths. The persistent infected sows will shed the virus to their offspring through the placenta and the piglets will become virus carriers.

When the piglets are weaned and commingle in nursery housing the carriers will shed the virus to the negative ones. The infected animals will get sick, be culled or finally die from PRDC. The principle of effective PRRS control includes four main strategies:

● Replacement animal acclimatisation

Replacement animal acclimatisation is crucial in managing PRRS since the incoming animals are the very common vectors which will bring the virus on to the farm. An isolation facility is also very important to this process in order to protect the virus from the replacement animals. In a negative naïve herd, the negative gilts are isolated and tested negative prior to entering the herd.

In a herd that chooses to remain positive and immunise gilts, the isolation unit is needed to allow these gilts to be immunised and clear any live virus or vaccine virus that may be used before entering the breeding herd.

● Pig flow and professional herd management

The pig flow and professional herd management is also very useful in controlling PRRS. The principle of this management is to stop or reduce viral circulation and protect re-infection within or among the herds on the pig farm. This management includes herd closure, to reduce virus circulation within the breeding herd. Temporary off-site weaning and partial nursery depopulation in the pig flow management process protects agasint re-infection between breeding and nursery or grower herds.

● Immune stabilisation

Breeding herd immune stabilisation is the beginning of PRRSv control in the infected breeding herd. The stable sow herd will reduce breeding performance loss from virus infection and will produce negative weaning pigs which is a good start for the pig production cycle.

● Biosecurity

Biosecurity is a very important process to prevent the virus from outside entering the farm and to reduce virus transmission within the production units on the farm.

Biosecurity measures include the cleaning and disinfection of facilities and vehicles; workers changing their clothes and boots; and controlling incoming visitors and animal vectors.

Moreover, the appropriate vaccination program is a very effective measure to control or even eliminate the virus from the farm.

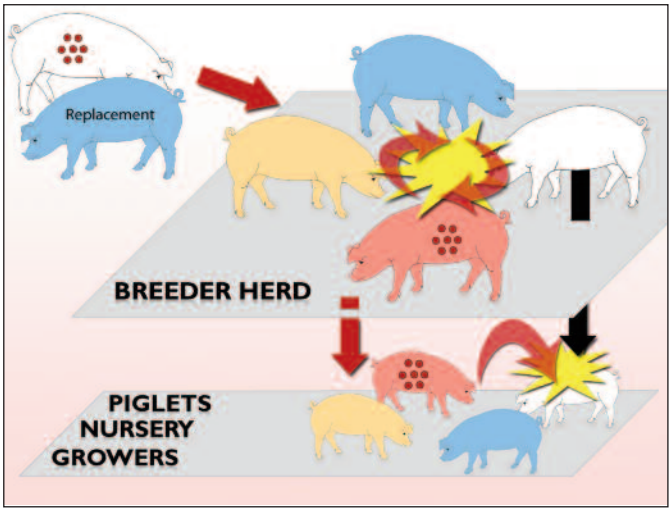

Fig. 1. The circulation of the PRRS virus on the farm.

The difference between control and elimination is that for control of PRRSV the overall goal is to control field virus in the herd; for elimination there are two goals: first to control field virus and secondly to eliminate all virus from the herd.

It is beyond dispute that a proper diagnosis of PRRS virus circulation in the herd is mandatory prior to initiation of vaccination.

However, following appropriate diagnostics it can be stated that quarterly mass vaccination of the whole herd has become a valuable tool in controlling the disease.

The prevention of new virus introduction is very important to sow herd stability. This has proven to be the most challenging part of any PRRS control program.

Targeted control of PRRS with vaccines is best accomplished by use of modified live vaccines (MLV).

Whole herd mass vaccination combined with early piglet vaccination programs is the most powerful tool to control the reproductive and respiratory forms of the disease.

Choosing the right vaccine and an appropriate vaccination scheme is crucial as cross protection against current prevailing strains is essential.

The usage of killed virus vaccines has not been shown to induce a great level of protection as MLV against highly virulent PRRSV strains.

Specifics of any program will vary depending on a farm's location, the producer's goal and the ability to implement the program.

Before setting the program objective for controlling or eliminating PRRS from the farm, we have to undertake a risk assessment, which includes both internal and external risk factors.

Internal risk factors are the factors which already exist on the farm that will promote viral circulation and transmission within the farm. Examples of the internal risk factors include the production system, pig flow management, husbandry practice, endemic disease, feed and water supply.

The external risk factors are the factors outside which will bring the virus on to the farm, such as replacement animals and semen sources, visitors and transport vehicles.

In conclusion, effective PRRS control includes understanding the nature of viral transmission, considering the risk factors to determine the appropriate objective goal and implementing all crucial intervention strategies – including the use of a modified live vaccine if needed. ■

References are available from the author on request