International Pig Topics

Pighealth BYTES

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Vaccinology XIV

PRRS vaccination

In Pighealth Byte 177, immunity induced by PCV2 virus or vaccines was described, which is a relatively straightforward to understand mechanism. How different this all is in the case of PRRS virus.

To start with: PRRS is much bigger than PCV2 virus, and has more proteins with antigenic properties. But not all antibodies induced by these antigens are protective. PRRS is an RNA virus with a high level of mutation and limited cross protection between different field strains. All very different from PCV2 virus. PRRS virus has a strong interaction with white blood cells and replicates in (lung-) macrophages, a specific white blood cell. Cellular immunity plays a dominant role in PRRS immunity.

PRRS virus, just like PCV2 virus, manipulates the immune system to produce messenger molecules (so-called cytokines) that cause more harm to the pigs than good. In the high fever PRRS virus infection that evolved some years ago in China, cytokine deregulation caused by the PRRS virus was the underlying reason for the high mortality in all age groups.

What about (PRRS-) Virus Neutralising (VN) antibodies, like in the case of PCV2 virus? Yes, they are formed after both vaccination and after natural infection but they are very short lived (2-3 months). There are many other and very different antibodies present after both natural infection or vaccination that have no virus neutralising properties. These so-called 'total-antibodies' are long lived and are picked-up by most diagnostic tests.

The information coming from these tests has little value: only that the animal has been in contact with the PRRS virus. Not when and not if there is any protection afforded by these antibodies or that any possible interference with vaccination in young piglets will occur. This coupled with the fact that a PRRS virus infection will spread slowly in a population of sows, means that the concept of herd immunity is absent and the quantity and quality of Maternally Derived Antibodies (MDA) with VN properties is varying.

In short, due to the variations in the PRRS virus, vaccination against PRRS virus often leads to disappointments, as do all other advocated PRRS virus control measures. PRRS immunity is still poorly understood. Also in clinical appearances there is a large variation. The name mystery disease was commonly used before the agent was detected but 30 years later, can easily be adapted to mystery virus!