Vaccinating pigs as part of artificial insemination

Some of the most important swine diseases impact reproduction or newborn pigs. To help protect their health we are exploring the possibility of administering a vaccine into the pig uterus during artificial insemination.

By protecting the uterus, we hope to prevent fetal deaths and disease in sows and gilts. It is also possible that, if we protect the mothers, they can give passive immunity to their offspring when they are young and the most vulnerable.

Intrauterine immunization could be a critical breakthrough in protecting pigs against important pathogens such as porcine reproductive and respiratory syndrome virus (PRRSV), porcine parvovirus, and porcine epidemic diarrhea virus (PEDV).

Can we prevent infection as well as fight it off?

Vaccines administered to a muscle activate a systemic immune response and are very effective at fighting the disease once infection has occurred. A vaccine administered to the uterus could prevent bacterial colonization and viral invasion directly at the site where many infections start.

INNOVATION AND PROGRESS

If we can combine administration of an effective vaccine with the common practice of intrauterine insemination, we can offer producers a new safe and labour-saving immunization approach.

Should intrauterine vaccination prove efficacious and without impact on reproductive performance, we will explore applications to protect both the sow and her piglet against production limiting infectious disease.

The Vaccine and Infectious Disease Organization (VIDO) is a world leader in infectious disease research and vaccine development.

Collaborating with national and international partners from government, academia, and industry, we aim to improve animal health, protect Canadian herds and ensure food safety by:

• Understanding how pathogens cause disease,
• Developing novel vaccines and therapeutics, and
• Improving vaccine formulations and delivery methods.

Our work has resulted in vaccines for porcine epidemic diarrhea virus and Actinobacillus pleuropneumoniae, as well as several others for cattle and poultry.

We have also developed more potent adjuvants, which enhance the immune response of vaccines, and novel approaches for needle-free delivery.
OUR RESEARCH

In small pilot studies, we see that an intrauterine vaccine can be given to sows/gilts without affecting semen function or fertility, and it can result in healthy litters. Larger studies will be required to confirm.

Furthermore, the vaccine formulation does not appear to significantly affect sperm function or fertility. Similarly, piglets do not appear to be negatively affected by the vaccine given to the sows/gilts before conception.

WHAT’S NEXT

In future research, we will consider investigating effectiveness against other common pathogens affecting sow and piglet.

Scan the QR code to watch a video on vaccination during artificial insemination.

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