Reducing antimicrobial use during the grower-finisher period

During their productive life, pigs are frequently exposed to infectious bacteria that cause respiratory and digestive diseases resulting in a significant economic impact for the swine industry, particularly if multiple pathogens are involved.

Outbreaks of bacterial diseases can only be treated and controlled by antibiotics; but antimicrobials in food animals have become a scientific, political and public concern.

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Adoption of preventive measures will allow pigs to express their real genetic growth potential.

The best options to reduce the amount of antimicrobials during the growing period and to prevent pig diseases are planned herd health programs that include pest controls, vaccination, biosecurity and disinfection.

Such programs result in economic benefits as they prevent and/or control subclinical and clinical disease development.

The most common grow-finish enteric disease is Porcine Proliferative Enteropathy (PPE) caused by Lawsonia intracellularis (LI).

Clinical or subclinical presentations of PPE, also known as Ileitis, causes thickening of the intestinal wall leading to poor growth rate and feed conversion. During the clinical phase of the disease, 5-20% of the herd may have diarrhoea, combined with occasional mortality.

Ileitis outbreaks are difficult to predict. PPE is controlled by in-feed antibiotics but on farms where such products are no longer acceptable, PPE vaccination can prevent the infection and reduce transmission.

Merck Animal Health (MSD in Europe) has developed a parenteral vaccine, Porcilis Ileitis, as an aid in the control of ileitis and to reduce the duration of faecal shedding of LI. In addition, the duration of immunity is at least 20 weeks.

As described in the examples below, Porcilis Ileitis has been successfully applied in antibiotic free Canadian farms with either clinical or subclinical ileitis.

Objectives

The objectives of the studies were as follows:

- To assess the efficacy of a LI vaccine (Merck AH) to control ileitis in a highly-challenged farm without antibiotics (RWA).
- To evaluate the safety of the vaccine.
- To assess LI faecal shedding and antibody titers in vaccinated and non-vaccinated animals.
- To determine the effect of vaccination in a subclinical infected RWA farm.

Materials and methods

Two field trials were conducted in two commercial farms raising pigs without antibiotics. In the first farm, severe losses due to PPE were observed.

In the second farm, although no clinical disease was found, more than 50% of the animals tested prior to the start of the trial were shedding LI.

- **Trial 1:** Approximately 2,500 pigs (10 weeks of production) from a 600-sow multisite farrow-to-finish operation were included in the study. This farm had a PPE history in the continuous-flow finishing barns. From the weekly weaned pigs (approximately 250 piglets at three weeks of age), 90% were randomly allocated to a 'vaccinated' group and 10% to a control group. Both groups were housed together. All pigs were vaccinated intramuscularly with a Porcine circovirus and Mycoplasma hyopneumoniae combination vaccine (Circumvent PCV M G2).

The treatment group was also injected IM with Porcilis Ileitis vaccine on a different side of the neck. All vaccinations were given per label indications.

During the first week, 30% of the vaccinated and 24% of the control pigs were weighed, and blood and faecal samples were collected to evaluate antibody titers and faecal shedding of LI at the time of vaccination (week 1) and at 11, 13, 17 weeks of age (WOA) and prior to slaughter.

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Fig. 1. Farm 1 – IFA titers in Porcilis Ileitis vaccinated vs control pigs in a farm highly challenged with L. intracellularis and no antimicrobial use.

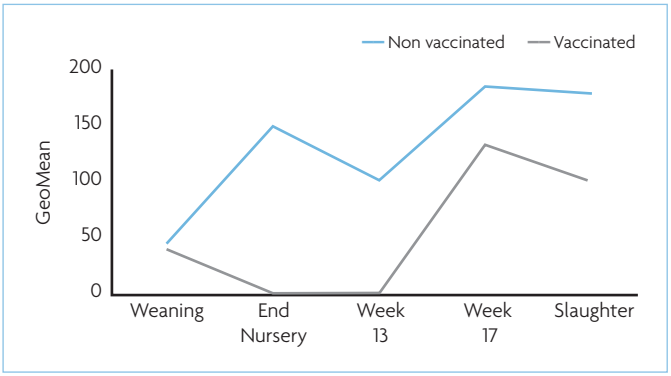
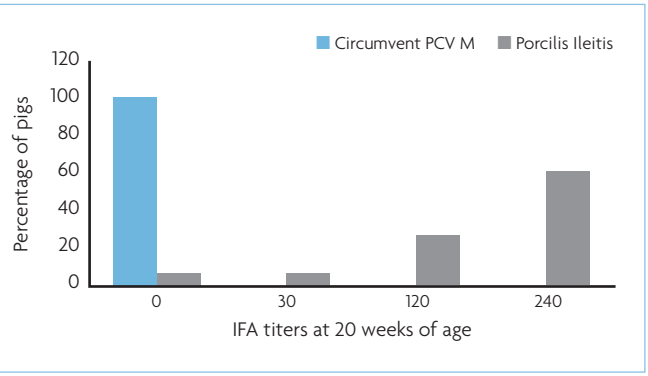


Fig. 2. Farm 2 – IFA titers at slaughter age in Porcilis Ileitis vaccinated vs control pigs from a farm with a low L. intracellularis challenge and no antimicrobial use.



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Indirect fluorescent antibody test (IFAT) was used to analyse the serum for LI antibody response. Faecal shedding of LI was tested/examined with a qPCR.

● **Trial 2:**

In a 300 RWA sow herd with no apparent Ileitis clinical signs but with 50% of faecal samples positive by qPCR before vaccination, Porcilis Ileitis effect on finisher pig weights was investigated. Weekly productions of piglets were randomly assigned at weaning to control or treatment group based on weight.

Control pigs were vaccinated with Circumvent PCV M G2 as per label indications at three and six weeks of age. Treatment pigs were also vaccinated with Porcilis Ileitis at weaning.

The farm was equipped with an automated pig sorter with an electronic scale that read each pig's ear tag. Both treatment groups were mixed in the same pens; weights were collected individually at the end of the hot nursery and daily at the GF barn (70 days). Serology samples were collected from 30 pre-selected pigs in both groups and were tested with IFA for LI antibodies.

Faecal samples were collected at the beginning and end of the trial from the same 30 pigs in both treatments and were examined for LI with qPCR. Descriptive statistics, cross tabulations, and chi square test were used for the statistical analysis.

Results

● **Farm 1:**

One pig (0.04%) was observed with an anaphylactic reaction and recovered without any complications.

Of the pigs sampled during the first week, 70% of pigs were LI seropositive. At the end of the nursery stage, all vaccinated pigs were LI seropositive and remained positive until 13 WOA.

Control pigs had no detectable LI antibody titers at the end of the nursery or at 13 weeks. 56% of control pigs at 17 WOA and prior to slaughter had measurable LI IFA titers (Fig. 1). All pigs were negative for LI faecal shedding at the end of the nursery.

At 17 weeks, 63% of vaccinated pigs and 28% of control pigs were negative or were low LI shedders, while 37% of vaccinated and 72% of vaccinated pigs were either medium or high LI shedders.

As of 17.5 weeks of age, (end of the study) all but one control pig were PCR negative. None of the pigs had clinical signs of ileitis, either because they were never affected or they recovered.

● **Farm 2:**

A total of 530 pigs were included in the study (265 pigs in each treatment). A total of 35,000 weight points of data were measured with a scale in GF. On average, vaccinated pigs were 1kg heavier than control pigs at 20 weeks of age.

The prevalence of subclinical ileitis in the herd was reduced from 50% to 23%, based on faecal LI qPCR results.

All pigs were serologically negative for LI post-weaning. At 20 weeks of age, only vaccinated pigs had a detectable LI antibody response in IFA (Fig. 2).

Discussion

Preventive medicine is the future for pig production to control disease in an environment with limited or no antimicrobial use. The results of the above field trials in two farms without antimicrobials and with either clinical or subclinical Ileitis, support that Porcilis Ileitis proved to be safe and that it induced a measurable immune response, which resulted in reduced level and duration of LI faecal shedding and increased weight at 20 weeks of age compared to controls.

The reduction of LI shedding will likely also reduce the prevalence of bacteria in the environment and consequently the possibility of infection in AMF farms.

Hence, Porcilis Ileitis should be considered as an effective alternative in the control of ileitis. ■

References are available from the author on request