New porcine ileitis vaccine offers efficient & cost effective solution

Porcine proliferative enteropathy or ileitis is caused by the intracellular bacterium Lawsonia intracellularis. Despite currently available treatment options, it remains an important enteric pathogen of growing pigs worldwide: with 20-50% of animals in commercial pig farms infected by this micro-organism. In the Minas Gerais state of Brazil, the number of affected pig herds is estimated at 20%.

by Rika Jolie,
Global Swine BU head, MSD AH.
www.msd-animal-health.com

The infection causes a proliferation of immature epithelial cells of the intestinal crypts, leading to a thickened gut wall and decreased nutrient absorption. Clinical signs vary from poor performance and feed conversion, diarrhoea and a predisposition to other diseases, such as porcine circovirus and mycoplasma infections, to increased mortality rates.

It is no surprise that the impact on pig performance can be a tremendous drain on profitability. While the cost of the disease varies widely, depending on factors such as concurrent disease and hygiene measures, in the US it is estimated at US$ 2.73 to US$ 19.79 per pig per year.

Vaccination, the preferred disease control method

Prevention and control measures are largely restricted to the use of antibiotics, such as macrolides, pleuromutilins and quinoxalines. But even though antibiotics may be effective, their use is increasingly controversial due to global requirements for reduced antibiotic use.

Combined with a growing bacterial resistance to some antibiotics and the risk of haemorrhagic proliferative enteropathy in long-term use, vaccination has become the preferred option for disease control.

Currently available live attenuated oral vaccines contain live micro-organisms, and require strict antibiotic-free management practices as antimicrobials may kill the vaccine antigen.

Injectable vaccine against ileitis

Merck Animal Health now offers the first injectable vaccine to fight against ileitis in pigs. Porcilis Ileitis was introduced to the US market in late 2015. The vaccine, given as a single dose at weaning, was found to provide ileitis control for at least 20 weeks after vaccination, reducing lesions, colonisation and faecal shedding.

Several field studies have confirmed its efficacy. "An effective injectable vaccine, which gives pork producers the ability to use antibiotics in the nursery if pigs become sick, thereby protecting their welfare," says Dr Robyn Fleck, Technical Swine Manager at Merck Animal Health (United States).

Results of a commercial study in the US showed that vaccination with Porcilis Ileitis decreased the clinical impact of Lawsonia intracellularis as vaccinates showed improved performance, fewer hospital pen removals and a reduced need for treatment. Getting pigs properly vaccinated early in life reduces the need for antibiotics later in the finishing phase.

Reduced antibiotic use helps lower the risk of developing antimicrobial resistance. Furthermore, studies have shown that long-term use of antibiotics has been associated with an acute onset of the disease in finishers – another reason to withhold antibiotics.

US study: five months' protection

A US challenge study showed that Porcilis Ileitis was effective in reducing the ability of L. intracellularis to cause gross and microscopic lesions in the small intestine as well as decreasing replication of the organism. Serum antibodies were detectable

Continued on page 16

The problem

- Lawsonia intracellularis is a rod-shaped, intracellular Gram-negative bacterium associated with porcine ileitis, also known as porcine proliferative enteritis.
- Lesions vary in severity and location but usually include gross thickening of some part of the mucosa of the intestine. The ileum is commonly affected.
- Porcine ileitis occurs worldwide and has a severe impact on pig performance.
- Traditional disease control consists of adding antibiotics to feed for several weeks during or after periods of stress and during outbreaks. This is not only costly but also contributes to antibiotic resistance.

The solution

A single-dose, ready-to-use intramuscular vaccine has now become available. Porcilis Ileitis is effective for at least 20 weeks after vaccination and was found to:

- Induce Lawsonia intracellularis antibody titers.
- Control ileitis.
- Reduce colonisation of L. intracellularis.
- Reduce duration and concentration of faecal shedding.

In contrast to the water-administered oral vaccine:

- 20 full weeks of disease protection, all the way to market.
- Protect for 13 weeks longer than the water-administered vaccine.
- Works even in the presence of antibiotics.

Continued from page 15
within three weeks of vaccination and a pronounced memory response after challenge was observed, both signs of a strong systemic immune response.

More importantly, the level of immunity in the gut also appears to be strong, based on the ability of the vaccine to reduce lesions, colonisation and shedding following a virulent experimental challenge. This protective immunity was shown to last for at least five months after vaccination, clearly demonstrating the efficacy of Porcilis Ileitis against disease caused by L. intracellularis. Porcilis Ileitis vaccination also dramatically reduces the level of faecal shedding in pigs directly challenged with L. intracellularis.

Canadian study: decreased shedding

A Canadian field study compared the faecal shedding and antibody titers to L. intracellularis in vaccinated and non-vaccinated animals, to see if vaccines may be an alternative for antimicrobial-free farms.

The study involved 2,500 pigs from a 600-sow, multisite farrow-to-finish, antimicrobial-free, highly challenged commercial farm.

Results showed that the Porcilis Ileitis vaccine stimulates the production of protective antibodies and reduces faecal shedding. The lack of clinical signs in control pigs kept in the same pens suggests that the decrease in shedding from vaccinated pigs provided some indirect protection by reducing the likelihood of exposure to L. intracellularis.

Brazilian field study: no antibiotics needed

A Brazilian field study compared the effect of vaccination with Porcilis Ileitis – with or without concurrent antibiotic treatment – on the performance of pigs, as well as carcase quality and immune responses.

The study involved 3,027 22-day-old piglets, randomly allocated to four treatment groups:

- T1: vaccinated with Porcilis Ileitis (IM at 22 days of age); no antibiotic treatment.
- T2: unvaccinated controls; no antibiotic treatment.
- T3: vaccinated with Porcilis Ileitis plus antibiotic treatment.
- T4: unvaccinated controls plus antibiotic treatment.

Animals from the T3 and T4 groups were given feed medicated with antibiotics, such as amoxicillin (400ppm), colistin (300ppm) and tiamulin (100ppm) from 22-29 days of age; tiamulin (150ppm) plus chlortetracycline (400ppm) from 30-62 days of age; and lincomycin plus spectinomycin (55ppm each) and doxycycline (300ppm) at 63-84 and 112-130 days of age.

Best results: vaccination without antibiotic treatment

Results showed that, during the growing-finishing phase, animals from the T1 group had similar results to those of the T3 and T4 groups regarding weight gain, mortality rate, incidence of ileitis, faecal shedding of L. intracellularis (112 days of age) and seropositivity. When looking at return on investment, the costs per kilogram of pig sold were US$ 1.15, 1.19, 1.23 and 1.26 for groups T1, T2, T3 and T4, respectively.

All costs included antibiotic use and vaccination with Porcilis Ileitis. During the growing-finishing phase and throughout the study period, the best cost-benefit ratio was noted in treatment group T1, receiving vaccine only. "The excellent field results show we do not need antibiotics to tackle this problem," concludes César Feronato, Technical Swine Manager of MSD Animal Health (Brazil). "It not only allows good antibiotic stewardship but also means a better return on investment. This is great news for pig producers in Brazil, where this vaccine has just been launched." ■

References are available from the author on request