PORCINE INTESTINAL ADENOMATOSUS (PIG ILEITIS)

Porcine Intestinal Adenomatosus (PIA), or more commonly known as pig ileitis, comprises a disease complex with a group of conditions involving pathological changes in the small intestine associated with the intracellular bacterium *Lawsonia intracellularis*. The organism affects the mucosal epithelium of the small intestine, mostly the ileum and sometimes even the colon, causing hypertrophy with or without haemorrhage.

The disease affects grower and finisher pigs of ages 6 to 20 weeks or older. It usually occurs as a mild, chronic infection with diarrhoea and weight loss or retarded growth due to poor feed efficiency. The acute haemorrhagic form is less frequent with bloody scours and sudden death.

Ileitis exists on most if not all farms. The disease takes on four different forms:

1. **Porcine Intestinal Adenomatosus (PIA)** – an abnormal proliferation of the cells that line the intestines, resulting in a thickening of the intestines.
2. **Necrotic Enteritis (NE)** – besides the gross thickening of the small intestine, the proliferated cells die and slough off, resulting in necrotic or ulcerative lesions.
3. **Regional Ileitis (RI) or Terminal Ileitis (TI)** – inflammation of the terminal part of the small intestine, and
4. **Proliferative Haemorrhagic Enteropathy (PHE)** – massive bleeding into the small intestine, hence the common name ‘bloody gut’ and this is the most common form in grower and finisher pigs.

The first three forms are rare and usually progress from PIA. PHE is more common in 60-90kg pigs and gilts.

Ileitis causes diarrhoea in grower and finisher pigs and primarily affects the distal part of the small intestine. It may extend into the caecum and colon, but this is rare, as the ileocaecal valve (ICV) or Bauhin's valve hinders the spread of ileitis to the proximal section of the large intestine. Severe, acute cases of ileitis such as that of PHE often cause sudden deaths, where the pigs are pale due to anaemia and their faeces are black, tarry and bloody. PHE occurs mostly in fattening pigs, young gilts and boars.
PIA: The intestinal wall thickens often with oedema to varying degrees. The mucosae are thrown into folds and may result in sharply defined plaques or marked multiple polyp formation.

NE: There is necrosis of the underlying PIA lesion resulting in yellow/grey cheesy masses that adhere tightly to the wall.

RI: The lower intestine becomes thickened and ridged. Often referred to as hosepipe gut. Ulceration can be often be seen in the mucosa.

PHE: The small and large intestines are dilated and filled with a blood clot. The colon contains black tarry faeces. The intestinal contents are rarely liquid. The intestines bulge out of the abdomen once opened.

The aetiological agent is *Lawsonia intracellularis*, a gram negative, obligate intracellular bacterium and member of the *Desufovibrionaceae* family. The incubation period after infection is around 2 to 3 weeks. The organism lives inside the epithelial cells lining the intestine (enterocytes) which leads to active cell proliferation and a thickening of the gut wall. This reduces the absorptive efficiency of the gut leading to depression of growth and feed efficiency by about 10-20%.

*Lawsonia intracellularis* is transmitted from pig to pig by an oral–faecal route. Nursing piglets may be first exposed to the disease via the sow’s faecal material. After weaning, the disease may be spread from older, infected pigs to young, susceptible pigs. Once infected by the organism, clinical signs may appear within 10-14 days and the organism is shed in the faeces for weeks. The presence of carrier animals in populations of pigs has been suspected to be a source of infection, but this has not been substantiated or characterised. Birds, rodents and contaminated equipment can also spread the disease.
**Disease Forms**

*Chronic form (weaners, growers)*

The pigs usually appear clinically normal, and still eat well during the initial stages. There is chronic watery diarrhoea, followed by gradual wasting and loss of body condition. In some cases there may be a pot-bellied, bloated appearance. Pigs with the chronic form of ileitis may sometimes recover over a period of 4 to 6 weeks, however there can be considerable losses in feed efficiency and daily gain of up to 0.3 and 80g per day respectively. As a consequence, there can be marked variations in sizes of pigs and poor uniformity in the herd. NI or RI may follow from it with similar signs, with necrosis in the distal portion of the small intestines and proliferation of the small intestinal cells which die and are sloughed off with a gross thickening of the small intestine or ‘hosepipe gut.’ In the chronic form of the disease, the symptoms may be masked by other problems such as respiratory problems.

*Acute haemorrhagic form (fattening pigs; sows, gilts in breeding stock)*

This form usually affects pigs between the ages of 4 to 12 months. Normally affects gilts, especially those that are newly bought, 7 to 10 days after being transferred to a commercial farm, during the stress period. Gilts in both commercial and genetic farms are affected, and many die from the disease. In the case of fattening pigs, ileitis can affect growers as well as finishers right up to 7 to 10 days before slaughter. Many of the affected pigs die from haemorrhagic ileitis. This is because very little attention is usually given to these fatteners, as most attention is given to the sows on heat, the gestating sows and the lactating sows. Because the disease is acute, in no time, the pig farmers start to realize that they are losing their pigs to ileitis, and by then it is usually too late.

Usually the finishers that are affected are those of top quality and the heaviest of the herd. Death is sudden, with blood from the anus, similar to that of Swine Dysentery but without the mucous and there is usually mucosal and cutaneous pallor.

**Treatment & Control**
In clinical and laboratory testing, a series of antibiotics such as tylosin, tiamulin, valnemulin, lincomycin and other tetracyclines are potentially effective. However, disease eradication seems impossible commercially, as reports have indicated disease recurrence upon cessation of the antibiotic treatment period, or at least *Lawsonia* shedding some weeks post-treatment.

Another problem faced with the medications used to treat ileitis is that there is always a withdrawal period, so pig farmers would have to keep their animals for a longer period of time before they can be sold and this usually disrupts their schedule or turnover cycle. In-feed antibiotics such as tiamulin and tylosin have been shown to be not very effective and treatment response to these drugs has been poor of the late, probably due to resistance.

Even if injectables are used, 20% of the best pigs of those affected will still die from ileitis, and only 50-60% will survive. These injectables have to be given 2-3 times, 12 hours apart. In the process of separating and injecting the animals, stress will usually kill some of the affected pigs. The cost and extent of labour is also extensive in injecting affected pigs. Thus it is a well-known fact that ileitis causes significant economic losses to the pig producer.

**Orego-Stim® & Pig Ileitis**

Orego-Stim® is very effective for the treatment and control of ileitis. In many herds with ileitis history, its application as a growth enhancer contributed significantly to reduce or even eliminate subclinical and chronic forms of the disease, without need for treatment. The absence of *Lawsonia* infection and intestinal lesions has been demonstrated using PCR and histopathology.

For effective ileitis prevention, Orego-Stim® Powder is typically included at 1kg per tonne for the first 2 weeks postweaning or up to 15kg bodyweight, followed by 500g per tonne up to the start of the growing period or 25kg bodyweight, and finally 250g per tonne throughout the grower-finisher period up to slaughter. In cases of severe acute haemorrhagic ileitis, it is recommended to include Orego-Stim® Liquid at 500ml per 1000L of drinking water during the first two days of treatment, followed by Orego-Stim® Powder at 500g per tonne for the next five days, and finally Orego-Stim® Powder at 250g per tonne for another week. Results are usually seen within 12-18 hours, where affected animals regain their appetite and start eating again. Producers affected by the haemorrhagic form are encouraged to conduct trials using the above recommendations in comparison to their current ileitis treatment regime, as soon as ileitis is suspected in a herd. The farmer should be able to note a reduction in death losses.

For chronic ileitis, treatment should be started one month before the usual onset of clinical signs. To prevent ileitis from spreading to a healthy group, start treatment before the observation of first clinical signs of ileitis in the diseased group. For both the diseased group and preventive group, double inclusion rate of Orego-Stim® during the 1st week of treatment. For short term treatment, Orego-Stim® Liquid may be used, at half the inclusion rate of Orego-Stim® Powder.

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