

# Bulletin

Boehringer Ingelheim Vetmedica, Inc.

TECHNICAL

## *Managing Subclinical Ileitis*

Ileitis (porcine proliferative enteropathy, PPE) can be expressed in a variety of forms. PIA (porcine intestinal adenomatosis) typically occurs in growing pigs causing reduced productivity and mild to moderate diarrhea in some pigs. PHE (porcine hemorrhagic enteropathy) typically occurs in late finishing pigs and replacement gilts as bloody diarrhea and sudden death. Gross and/or microscopic lesions of PPE accompany both PIA and PHE. A less easily recognized but more prevalent type of ileitis is the subclinical form of the disease.

### **Subclinical ileitis defined**

Subclinical ileitis can be defined as *infection with Lawsonia intracellularis (Li) with resulting reduced productivity (ADG and FE) in the absence of overt clinical signs of disease such as PPE-related mortality, diarrhea or other symptoms consistent with PPE morbidity*. Increased variation in body weights typically accompany reduced growth rates resulting in additional economic losses due to sort loss. Gross or microscopic lesions of PPE are present but of insufficient severity to result in overt clinical signs.

### **Subclinical ileitis is highly prevalent and costly**

Due to the ubiquitous nature of Li infection, subclinical ileitis is a common and costly global problem. A US national serological survey found 96% of all swine herds were infected with Li<sup>1</sup> while in a subsequent US national survey only 37% of producers actually recognized ileitis as a problem in their herds<sup>2</sup>. A Canadian investigation implies that 40% of Ontario herds are subclinically infected<sup>3</sup>. A Swedish investigation found that in addition to Li being the most common cause of infectious enteric disease in growing pigs, 41% of non-diarrheic pigs from poor-performing herds were subclinically infected with Li<sup>4</sup>. A controlled subclinical ileitis study detected a 30% decrease in average daily gain and 23% decrease in feed efficiency<sup>5</sup>.

### **Immunization is a better alternative than antibiotics**

An immunologic approach to population protection has been conclusively shown to be a more effective and prudent alternative to overuse and limited effectiveness of feed antibiotics<sup>6,7</sup>. Enterisol Ileitis is a vaccine rather than an antibiotic thereby inducing long-term uniform population immunity. *A primed and protective immune system doesn't discriminate between low infection pressure (such as a subclinical ileitis challenge) or high infection pressure. Upon re-exposure to an antigen the immune system recognizes it and responds quickly to protect the host. Since the immune response stimulated by Enterisol Ileitis is sufficiently efficacious to protect against clinical-intensity challenges<sup>5</sup> then it naturally follows that it is protective against a less severe subclinical-intensity challenge.*

### **Evidence that vaccination controls subclinical ileitis**

Several field studies confirm the ability of Enterisol Ileitis to control subclinical ileitis. Trial 1<sup>9</sup> was a randomized and blinded clinical study utilizing over 800 pigs. Feed antibiotics were only used at weaning and intermittently during the first 2.5 weeks post-weaning. Vaccinated groups received Enterisol Ileitis at 7 weeks of age. Li infection was previously confirmed in the weaning, finishing, and breeding barns. Li infection and lesions were also confirmed in the study groups but no clinical signs of ileitis occurred during the trial thereby resulting in a naturally occurring subclinical Li infection. Vaccination with Enterisol Ileitis significantly ( $p < .05$ ) improved weight gain (+5.5% at 24 weeks of age) and significantly ( $p < .05$ ) reduced the prevalence and length of PPE gross lesions in the presence of the subclinical ileitis challenge.

Trial 2<sup>8</sup> was a “before and after” evaluation of Enterisol Ileitis as part of a continuous improvement project in a large production systems’ finishing sites. Li infection was confirmed prior to and during the trial. The same barns/sites were seasonally matched and used in the comparison. Non-vaccinated Control groups (11 barns; 28,859 pigs) were continuously provided feed antibiotics routinely used for ileitis and other disease prevention/control and growth promotion in this production system (carbadox 25 g/t finishing weeks 1-4; bacitracin md 30 g/t weeks 5-8 and 12-18; and tylosin at 100 g/t weeks 9-11). Vaccinates (10 barns; 26,230 pigs) were vaccinated with Enterisol Ileitis during the 5<sup>th</sup> week in the nursery and received the same medicated finishing diets with the exception of tylosin being withheld in weeks 9-11. Clinical signs of ileitis were inapparent in the continuously medicated control groups suggesting that medication controlled (‘masked’) clinical expression of disease but did *not* completely control the detrimental bio-economic effects of confirmed subclinical Li infection. Vaccination with Enterisol Ileitis significantly ( $p < .05$ ) improved weight gain (+5.5%), feed efficiency (-4.9%) and reduced total mortality (-1.3%) even with reduced feed medication usage in the presence of the subclinical ileitis challenge.

### **Antibiotics may induce rather than reduce subclinical ileitis**

Feed antibiotics may ‘mask’ awareness of ileitis by reducing the expression of clinical signs without controlling the detrimental bio-economic effects of Li infection<sup>9</sup>. *In fact, altering the expression of ileitis from clinical to subclinical may be a frequently overlooked outcome of feed antibiotic programs.* A false sense of security in the feed antibiotic program and unrecognized ongoing losses to ileitis are the unfortunate result. Use of marginally effective antibiotics<sup>9</sup>, improper timing; insufficient inclusion rates and duration or frequency of medication all limit the effectiveness of trying to manage ileitis with antibiotics.

### **Conclusions**

- Enterisol Ileitis
  1. controls both clinical and subclinical ileitis
  2. allows reduction or elimination of continuous use of feed antibiotics
  3. improves bio-economic performance
- Tylosin feed additive used per it’s approved label may *induce* rather than *reduce* subclinical ileitis.

### **References**

1. M Bronsvoort et al. Management factors associated with seropositivity to *Lawsonia intracellularis* in US swine herds. *J Swine Health Prod* 2001;9(6):285-290. [based on NAHMS 1995 sera]
2. NAHMS Swine 2000 part 2. [www.aphis.usda.gov/vs/ceah/cahm/Swine/Swine2000/swinepart2.pdf](http://www.aphis.usda.gov/vs/ceah/cahm/Swine/Swine2000/swinepart2.pdf)
3. Wilson J et al. A descriptive study of the frequency and characteristics of proliferative enteropathy in swine in Ontario by analyzing routine animal health surveillance data. *Can Vet J* 1999 (40):713-717.
4. M Jacobson et al. Diarrhoea in the growing pig - a comparison of clinical, morphological, and microbial findings from animals between good and poor performance herds. *Res Vet Sci* 2003(74):163-169.
5. N Winkelman et al. Use of a challenge model to measure the impact of subclinical porcine proliferative enteritis on growth performance in pigs. *Proc AASP* 1998:209-211.
6. J Kolb, F Sick. Summary of field trials implementing Enterisol<sup>®</sup> Ileitis against ileitis. *Proc AASV* 2003:243-244.
7. J Waddell, P Sherlock, D Walter, J Kroll. Ileitis vaccination controls ileitis in the complete absence of oral antibiotics in a start-up breeding farm. *Proc AASV* 2003:245-246.
8. Boehringer Ingelheim Vetmedica, Inc., data on file.
9. M Veenhuizen et al. Evaluating a natural outbreak of porcine proliferative enteropathy and treatment with tylosin in the grow-finish phase. *J Swine Health Prod* 1998;6(2)67-72.