

2ND BOEHRINGER INGELHEIM IPVS ILEITIS SYMPOSIUM, COPENHAGEN, JULY 17TH, 2006

Global experiences with Enterisol® Ileitis

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Carlos Piñeiro, Jeff Kaisand and John Wadell



Global experiences with Enterisol® Ileitis

1. Field efficacy of Enterisol® Ileitis in two Philippine swine farms: Gilt vaccination

Carlos Cantor (Swine Practitioner, Philippines)

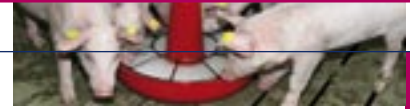
Introduction

Tarlac Sentra Farms, Inc. is a 550-sow level pig-gery farm situated in Sta. Ines, Sta. Ignacia, Tarlac, a province north of Manila with an estimated total breeder population of 5,000 sows. The farm's performance is considered at par with the industry's established performance standard in the region, such as, 78% average farrowing rate and pre-weaning mortality rate of 7% in 2004. From time to time the farm experienced enteric problems highly suggestive of Ileitis, particularly in the starter and grower stages. The usual

approach in order to control this was by incorporating antibiotics in the feeds. Notwithstanding its presence, the mortality rate was still quite minimal, hence, the decision of the farm management not to vaccinate, yet.

Ileitis history

The farm brings in an average of 35 replacement gilts every month. About 20 of these are externally sourced while the rest are selected from the farm's herd. It was in September 2004 when the farm first noticed alarming Ileitis symptoms among the young gilts with 1 to 2 mortalities per month due to acute Ileitis, despite heavy medication. This continued till the 1st quarter of 2005, with the cases getting worse each month,



during which the farm just relied on antibiotics, but to no avail. By April, the mortality increased to 5 gilts including gestating ones.

Enterisol® Ileitis vaccination

Being aware of the repercussion and negative impact on the production performance, the management finally decided to vaccinate the gilts using Enterisol® Ileitis beginning May 2005. Within 5 to 7 days from arrival, all gilts were individually drenched singly at 2 ml per dose.

The effect of the vaccine was quite dramatic. There were no more Ileitis-related mortalities after the vaccination was included in the program. Since then, Enterisol® Ileitis vaccine has become an integral part of the farm's standard vaccination program for new breeders.

Ileitis Future

The effect was tremendously felt by Sentra Farm, that the same program was likewise adopted in its sister company, Everlasting Farms, Inc. The latter has a bigger capacity, operating at 800-sow farrow-to-finish. Similarly, the farm is located within the same province, but situated in San Isidro area, with an estimated total sow population of 7,500 heads.

2. Experiences with Enterisol® Ileitis under field circumstances in Germany

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Introduction

“Prevention is better than treatment” is a basic rule for modern pig farms. Subclinical Ileitis, caused by Lawsonia intracellularis, is a disease detracted from the eye but very much present in many farms despite the use of antibiotics. We, a German swine vet practice tried out the new vaccine, Enterisol® Ileitis. This is the case description.

Materials and Methods

Enterisol® Ileitis was used in a farrow-to-finish farm. Clinical problems due to *Lawsonia intracellularis* were present in the finishing unit and at the end of the flatdeck, despite the use of up to 200 ppm of Tylosinphosphate (Klatolan feed®) for three weeks or more. Piglets were vaccinated three to four days after weaning. Vaccine was applied by drench or by through. Longitudinal data were captured of four groups of non-vaccinated pigs (n = 785) and compared to four groups of vaccinated pigs (n = 809).

Results

Undesirable effects related to the vaccination were not seen on the farm. The efficacy of the vaccination was very high and the use of antibiotics for the prevention of diarrhoea was



ceased completely. Total costs for antibiotics on the farm dropped by 50%. At the same time the groups showed a reduction in variability and the total days of fattening. The farm manager stated that the vaccinated groups had a better overall health status. Problems with respiratory diseases decreased. The ADWG increased on average by 74 g/d and mortality dropped by 2%. Also the percentage of pigs that needed more than 125 fattening days was reduced by 6.1%.

*Table 2.1
Results after vaccination with Enterisol® Ileitis*

	Non-vaccinated animals	Vaccinated animals
Animals included (n)	785	809
ADWG (g/d)	773	847
>125 days of fattening (%)	13.1	7.0
Mortality (%)	3.1	1.1

Conclusion

The easiest and nonetheless most reliable method of application seems to be the through. Based on our experiences up to now with the Ileitis-vaccine we conclude that:

- ① The vaccine creates an effective immunity against the chronic clinical form of Ileitis (PIA).
- ① The vaccine improves animal production, when compared to antibiotics in cases with clinical Ileitis.
- ① The vaccine showed no undesirable effects.
- ① Animals that have been vaccinated seem to have fewer problems with other diseases whereas the overall antibiotic usage has decreased.

The reduction of antibiotic use is something that should be extrapolated carefully to other farms which start to vaccinate with Enterisol® Ileitis, to prevent over-expectation of the vaccine regarding the ability to reduce antibiotics.

3. The way towards vaccination with Enterisol® Ileitis and first results of the implementation in a farrow-to finish farm in the Netherlands

Martijn Steenaert DVM (DAP Groenlo-Lichtenvoorde, Lichtenvoorde, The Netherlands)

Farm situation

The farm is a 130 sow farrow to finish operation working in a 3-week rhythm with Topigs 30 genetics. Topigs 30x Pietrain pigs are fattened in three separate locations. The farm is located in the Eastern part of the Netherlands in an area with a high density of pigs. The experiences with Ileitis on one of the finishing-sites with 750 places are presented in this paper. The farm has a high production level, weaning more piglets per sow per year than the Dutch average and an average daily weight gain of nearly 800 grams in the fattener units corrected for the growth between 25 and 105 kg live weight. The mortality rate was below 2%.

History

Since end 2003 chronic Ileitis among fatteners was suspected. Poor-doers and occasional diarrhoea were present at 4 weeks after the beginning of fattening. Necropsy of an affected animal

affirmed colitis with the presence of *Brachy-spira spp.* Furthermore, catarrhal enteritis with haemorrhagic contents in the small intestine was described. In the spring of 2004 a cross-sectional serological screening with an immunofluorescence test (IFAT) was performed following continuing complaints about loss of productivity possibly caused by *Lawsonia intracellularis*. The results showed a clear onset of seroconversion at 14 weeks of age, confirming the clinical signs (see Table 3.1).

Table 3.1: Serological results for *Lawsonia intracellularis* antibodies (IFAT) in 2004.

Age (weeks)	10	14	18	21
Number of positive animals per group	0/5	5/5	5/5	5/5

Based on these results in combination with the clinical symptoms seen in the affected units, the management and veterinarian decided to medicate the next batches during the first 3 weeks of fattening by in-feed medication of tylosin at a rate of 100 ppm (~4 – 5 mg/kg LW).

The effect of medication was visible in the production traits and the uniformity within and between batches turned out satisfactory at the end of 2004.

The switch to vaccination

At the beginning of June 2005, one year after the prophylactic medication regime with tylosin was started; the decision was made to cease this medication and await the effect of this. Although no visible change in uniformity be-

tween and within batches was seen, the average daily weight gain dropped in 2005 to 765 gr/d. In the autumn of 2005 again a cross-sectional investigation for serum antibodies against *Lawsonia intracellularis* was performed this time using a newly developed ELISA. The results, shown in Table 3.2, show that the infection was still present as a seroconversion occurred at 16 weeks of age and intensified with the progression of the age of the animals.

Age (weeks)	16	21	24
Number of positive animals per group	1/8	6/6	4/4

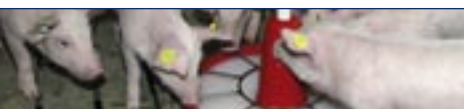
Table 3.2: Serological results for *Lawsonia intracellularis* antibodies (ELISA) in 2005.

Based on these results vaccination with Enterisol® Ileitis was started as an alternative to the previous medication with tylosin. An additional reason was the aim to reduce the use of antibiotics and to work in a preventive manner instead of the previous prophylactic regime.

Since February 2006 all pigs are vaccinated by drench with Enterisol® Ileitis at 28 days of age, this is approximately 2 days after weaning.

First results

The first groups of vaccinated animals were slaughtered end of May. The results as they are seen up to now are very promising. The mortality rate has dropped to 1% and an average batch of pigs now needs less than 110 days to slaughter. Moreover, the batches are almost completely emptied in two check-outs to the slaughter house with a significant reduction in lightweight and culled animals, indicating a highly uniform production. After the drop in ADWG in 2005, the



farmer is indicating that this is now increasing again, approaching 800 gr/d. The overall low usage of antibiotics dropped almost to zero in the first part of 2006.

Benefit of Enterisol® Ileitis vaccination

The most eye-catching result for the farmer is the improved uniformity. He has little to none animals that need to be culled and has ease of work by only 2 check-outs per batch to the slaughter house. The vaccination by drench is well accepted. The production traits of the farm have improved and are back at a level before Ileitis became a problem. The mortality has dropped and the need for antibiotic intervention or prophylaxis against Ileitis is no longer present.

4. Enterisol® Ileitis vaccination improved productive performance in two Spanish farms

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Introduction

Ileitis is widespread in pig farms nowadays, with a prevalence up to 100% in some countries. Antibiotics have demonstrated its efficacy in the treatment but they are only effective while being used and do not prevent against re-infections. This study was performed to determine the effect of Enterisol® Ileitis vaccination in productive performance and weight homogeneity in two Span-

ish farms, one with moderate levels of infection and better health and the other with higher levels of infection and lower health status.

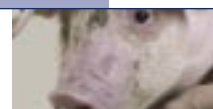
Material and methods

Two farms of 700 and 250 sows farrow to finish were selected based on clinical symptoms and prior laboratory positive diagnostic for *L. intracellularis* infection. Both farms were PRRS positive and free of *Salmonella spp.* and *B. hyodysenteriae*. No antibiotics through feed or water were used. In farm 1, a total of 600 pigs were randomly distributed in 60 pens of 10 pigs each. In the second farm, 192 pigs in 16 pens of 12 pigs each were used. In both farms, pigs were randomly assigned to two treatments: Control or Enterisol® Ileitis. Pigs were vaccinated in the nursery period at least 6 weeks before of the later serum conversion to Ileitis infection.

Average daily gain (ADG), feed intake (FI) and feed conversion ratio (FCR) were controlled every two weeks until slaughter weight. Data were analysed by the GLM procedure of SAS (1996) for randomised complete block designs using initial weights as a covariate.

Results and Discussion

In farm 1, pigs vaccinated with Enterisol® Ileitis showed a better FCR in the overall period (2.77 vs 2.83, $P < 0.05$) and tend to show better ADG (886 vs 872, $P = 0.07$). Results are presented in Table 4.1. Differences were significant in every control during the growing period (88–130 d of age) including the time while an outbreak of



a respiratory disease occurred (116 to 130 d of age), as presented in Figure 4.1. In farm 2, pigs vaccinated with Enterisol® Ileitis also showed higher ADG (696 vs 673, $P=0.10$) promoting a higher final weight (93.03 vs 90.42, $P=0.10$) as is showed in Table 4.2. It is also remarkable that pigs were more homogeneous (Figure 4.2) at the end of the fattening period (SD 10.82 vs 12.24).

Conclusions

Enterisol® Ileitis vaccination improved productive performance both under conditions of moderate level of Ileitis infection and higher performance, and also under lower health status and performance, improving also pigs homogeneity at the end of the fattening period.

	ADG	74 - 144 d of age		ADG	51 - 144 d of age	
		FI	FGR		FI	FGR
Control	872	2544	3.02	836	2269	2.83
Enterisol® Ileitis	886	2572	2.96	843	2268	2.77
SEM	5.73	23.39	0.024	4.79	17.66	0.021
Prob.	0.070	NS	0.066	NS	NS	0.038

Table 4.1
Overall performance
in Farm 1.

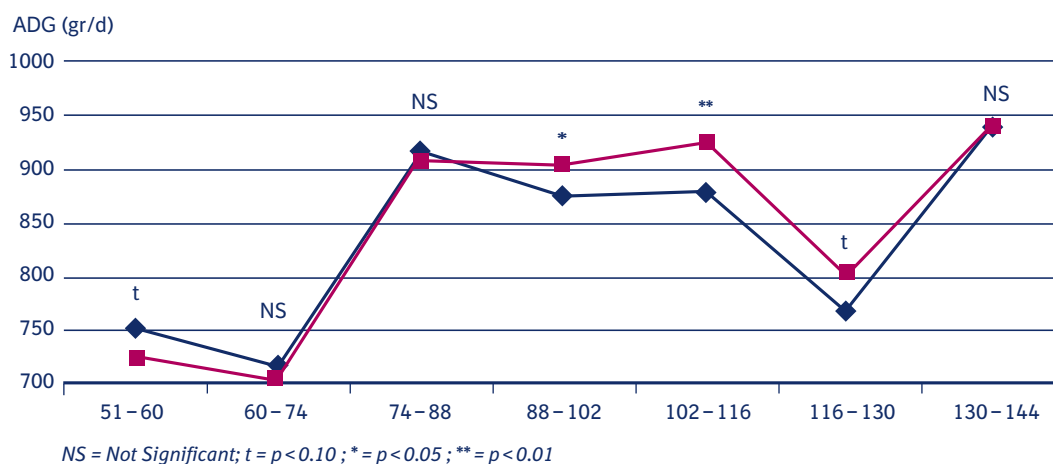


Figure 4.1
Time course of ADG
in Farm 1.

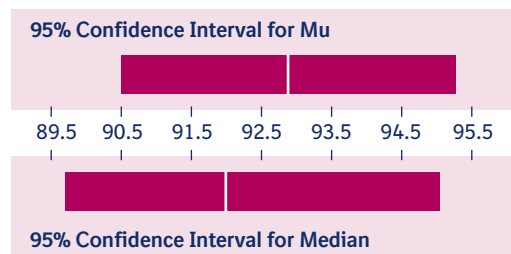
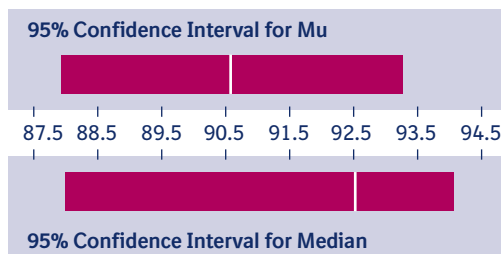
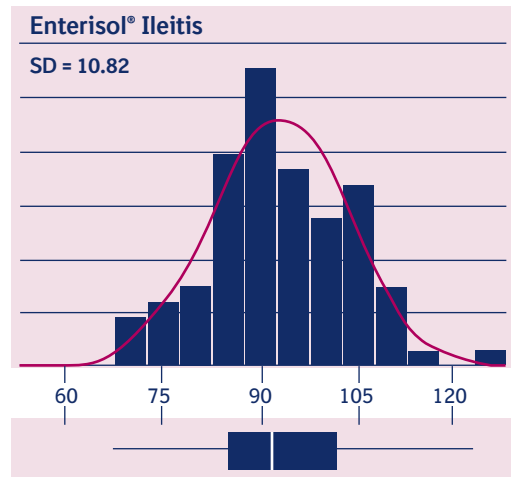
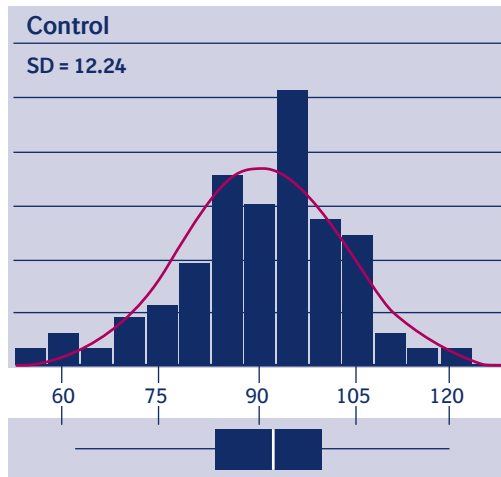
Control
Enterisol® Ileitis

Days of life	47	78	102	116	130	144	158
Control	15.83	34.87	53.69	64.07	71.58	80.61	90.42
Enterisol® Ileitis	15.77	35.42	55.05	65.60	73.45	82.38	93.03
SEM	0.209	0.274	0.525	0.611	0.762	0.939	1.121
Prob.	NS	NS	0.067	0.076	0.082	NS	0.10

Table 4.2
Body weight evolution
in Farm 2.



Figure 4.2
Final weight distribution in Farm 2.



5. Managing *Lawsonia intracellularis* infections in a large production system in the USA

Jeff Kaisand, DVM; Andy Holtcamp, DVM
(Iowa Select Farms, Iowa Falls, Iowa, USA)

Introduction

Our production system raises approximately 2.5 M pigs per year, out of a total US production of 100 M pigs. Production facilities are typical for the Midwestern U.S. We have an average sow farm size of 4000 sows, with approximately 1500 new gilts per farm per year. Nursery and finishers are housed separately off site (multi-site production).

Most finishing barns have deep pig manure storage over slatted floors, though 20% are shallow pits with “pull plug” systems. In this large a production system, health controls, like any management programs, must be standardized, simple and repeatable to apply, and deliver consistent results, with little added treatments needed.

Situation before vaccination

The history of enteric disease in our pigs included all common pathogens seen in commercial pig production – feed induced diarrhoea, gastric ulcers, Salmonellosis, PCV-2, non-specific



colitis, hemorrhagic bowel syndrome, torsions and endemic TGE (transmissible gastroenteritis virus). These conditions were diagnosed by routine pathology and histopathology. Both the chronic/PIA form and acute/PHE forms are present in the system. Chronic diarrhoea historically began in commercial pigs from 70 kg/150 lb to market, in the finishing barn. Hemorrhagic Ileitis would occur in some groups of pigs around the first marketing cut, and in replacement gilts after placement into sow farms, at around 33 weeks of age.

Control of *Lawsonia intracellularis* and other enteric diseases was attempted with feed grade medications. In nursery pigs, a system of carbadox, tiamulin/chlortetracycline and chlortetracycline alone was used. This continues today for its broad spectrum respiratory and enteric benefit. Control of *Lawsonia intracellularis* in finishing was based on several combinations of tylosin, either at 110 ppm followed by 44 ppm, or 44 ppm continuously from 35 to 60 kg. Breaks on this medication program occurred frequently, at an average of 70 or more enteric cases per month. Water soluble tylosin was used as the first treatment option. When cases would not respond, water therapy was changed to tiamulin.

Situation after vaccination

The goal for use of Enterisol® Ileitis FF was to reduce overall in-feed and water medication use, and, with similar cost, improve clinical control of disease in both high value replacement gilts and finishing pigs. Replacement gilts were the first target for vaccination given their cost and the poor response to treatment of PHE cases. Vaccination of these animals began in 2001.

Following success in these animals, vaccine was tested in finishing pigs in 2002, with pigs vaccinated at 12–14 weeks of age, just following placement into finishing.

Vaccination has dramatically altered the feed medication program in finishing pigs and replacement gilts. Routine use of both in-feed tylosin as well as growth promoting antibiotics has dropped to zero. The numbers of groups needing treatment for diarrhoea of any kind has been reduced over 75% (<15 cases/month now) even with the removal of all in-feed medications. This has made health management much simpler at the field supervisor level, as well as in the feed mill.

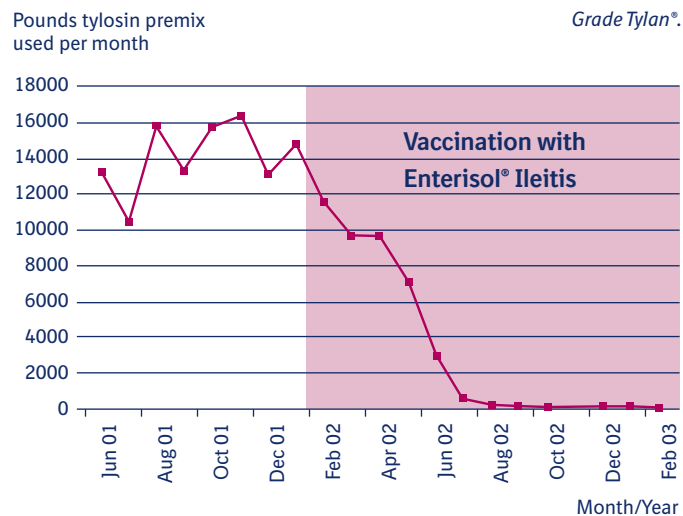


Figure 5.1
Influence of vaccination with Enterisol® Ileitis on use of Feed-Grade Tylan®.

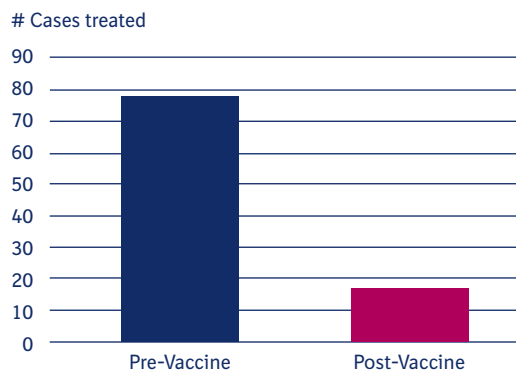


Figure 5.2
Treatments for Ileitis-like disease pre- and post-vaccination.



Ileitis vaccination controls Ileitis in the complete absence of oral antibiotics in a start-up breeding farm

John Waddell (Sutton Veterinary Clinic, Nebraska, USA) and Pete Sherlock (Washington Vet Clinic, Kansas USA)

Introduction and Objectives

*Porcine Hemorrhagic Enteropathy (PHE), the acute form of Porcine Proliferative Enteropathy (PPE), is often a significant problem when populating farms with breeding animals. Routine use of high levels of feed antibiotics has historically been required to control PHE. A disadvantage of continuous use of antibiotics is the prevention of natural exposure to and development of immunity against certain bacterial pathogens including *L. intracellularis* leaving animals potentially susceptible to disease when medication must eventually be discontinued. This case report describes clinical and diagnostic observations from a newly constructed 1250-sow breeding farm (gilt multiplier; Site 1) and its downstream gilt offspring wean-finish site (Site 2) in which immunization against *L. intracellularis* rather than routine feed or water antibiotic medication was used to prevent/control PPE.*

Materials and Methods

Site 1 was originally stocked with gilts from a *Lawsonia*-infected source farm. Gilts were vaccinated against *L. intracellularis* at the source farm prior to shipment to Site 1. Some of these animals were from groups in which clinical signs of Ileitis were present prior to vaccination suggesting that natural infection had probably occurred

in some animals prior to vaccination and shipment to Site 1. Vaccination was accomplished using a single dose of a commercially available federally licensed attenuated live oral *L. intracellularis* vaccine, Enterisol® Ileitis. Non-vaccinated gilts from this same source were used as replacement gilts for three other existing farms during the same timeframe (4Q00) when *Lawsonia*-vaccinated gilts were shipped to Site 1. Breeding was initiated at Site 1 during NOV00 and farrowing began MAR01. Gilt offspring from Site 1 were first introduced to Site 2 in APR01. Site 1 has been closed to new animal introductions since initial stocking. A whole-breeding-herd booster revaccination via drinking water was conducted in May 2001.

No feed or water antibiotics were used on Sites 1 or 2. Antibiotic injection of individual animals was permitted if indicated. Rectal swabs from diarrheic animals were collected for fecal PCR detection of *Lawsonia*. Sera collected at both sites 1 and 2 were tested for antibodies against *Lawsonia* using an IFA test.

Results and Discussion

Clinical observations:

No outbreaks of any form of PPE have been observed at either site in spite of the complete absence of any feed or water antibiotic use. However non-vaccinated gilts from this same original gilt source that were shipped to at least three different non-vaccinated herds during this same stocking timeframe did experience PHE outbreaks. Total gilt/sow mortality at Site 1 has been 8.3%. Total wean-finish mortality at Site 2 has been 3.3%.



No adverse effects of any kind (including reproductive effects) of Ileitis vaccination were noted in response to the whole breeding herd revaccination in May 2001. Previously vaccinated gilts in all stages of breeding, gestation, and lactation were present in the herd at that time. Site 1 performance for the first 7 months of 2002 were 21 – 22 pigs weaned/sow/year, 2.2 – 2.3 litters/sow/year, 12.14 total pigs born/litter, 10.5 live pigs born/litter, and 9.5 pigs weaned per litter.

Diagnostic observations:

Fecal PCR:

A single PCR-positive gilt has been detected at Site 1 and another (offspring) at Site 2. Since some of the gilts used to originally stock Site 1 were probably infected prior to vaccination, it is probable that the field strain of *Lawsonia* from the source farm was introduced with these animals.

Serology:

7/61 (11%) sera collected at Site 1 in MAR01 from the initial stocking of gilts were seropositive to *Lawsonia*. Serum IgG antibodies against *Lawsonia* are short-lived (perhaps 1 – 2 months). It is not known if this seroconversion was due to recent natural infection or initial vaccination. No serologic response was noted to the whole herd re-vaccination in May. This is consistent with previous observations that seroconversion to primary immunization is inconsistent and unrelated to protection since seronegative vaccinates have consistently been protected in challenge studies. This may be due to the protective immunologic response being mediated by mucosal antibody and/or cell mediated immunity rather than serum IgG. Only 2/267 (0.75%) tested animals at Site 1 were seropositive from JUN – DEC01. Only 1/119 (0.84%) at Site 2 have been seropositive from JUL – DEC01.

Necropsy observations:

No lesions typical of *L. intracellularis* infection have been observed in animals necropsied at Site 1. Only one pig with confirmed PPE lesions has been found at site 2.

Based on clinical, serologic, and necropsy observations *Lawsonia* infection/PPE have been very well controlled in the breeding and wean-finish sites by *Lawsonia* vaccination in the complete absence of feed and water antibiotic medication. Immunization is preferable to antibiotic medication for long-term management of PPE as unnecessary overuse of antibiotics (especially human-use classes of antibiotics) in food producing animals comes under increasing public health scrutiny.

Summary Points:

- Replacement gilts vaccinated at finishing age have remained asymptomatic for Ileitis through first parity in a positive adult herd.
- Booster vaccination was given to the adult herd 6 months following initial vaccination.
- Monitor clinical and diagnostic samples to confirm effective control.
- Antimicrobial feed and water medication against Ileitis may be significantly reduced or eliminated with proper use of Enterisol® Ileitis vaccine.

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