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Determining the Efficacy of Tylan as an Intervention in a Lawsonia intracellularis Challenge Model Designed to Create Subclinical Ileitis

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Introduction

Clinical porcine proliferative enteropathy (ileitis) in swine has reportedly cost as much as $22.19 per pig.[1] The impact of subclinical ileitis (the presence of *Lawsonia intracellularis (Li)* without overt clinical signs) has not been demonstrated during the grow-finish period. The objectives of this study was 1) to use a lower than normal challenge dose of *Li* gut homogenate in an attempt to produce a subclinical infection, 2) measure the performance impacts of a subclinical infection and 3) measure the efficacy of Tylan® in such a model.

The definition of subclinical disease was satisfied when the following five conditions were met on a pen basis; 1) >75% seroconversion to *Li* via IPMA or a positive *Li* fecal PCR on pooled samples from all individuals in a pen; 2) <1.5 body condition score; 3) <1.5 behavior score; 4) <2.5 fecal consistency score; and 5) statistically significant decrease in performance. The extent of the decreased performance was to be demonstrated in this study.

Materials and Methods

One hundred twenty pigs at six weeks of age were randomly assigned to 24 pens in a barn with 5 pigs per pen, using weight and gender as blocking criteria. Treatment groups were Challenge Control (CC) and Challenge Tylan® (T). Pen was the experimental unit. T received Tylan® 100g/ton from Day-3 to Day 18, Tylan® 40g/ton Day 18 to Day 84 and Tylan® 20g/ton from Day 84 to Day 140. A strict control group was also included to insure adequate infection occurred. The investigator was blinded to treatment for the challenged groups only. Pigs were challenge inoculated with $3.4x10^5$ *Lawsonia* organisms per pig at six weeks of age (Day 0). This dose was selected because it created performance effects without clinical scores in a 3 week study.[2] For the first six weeks post-challenge, the following parameters were recorded and analyzed. Feed intake and weekly pen weights were recorded. Fecal consistency (1-4 scale, with 1=normal), body condition (1-3 scale, with 1=normal), behavior (1-3 scale, with 1=normal) were recorded three times per week. Biweekly serology (IPMA for *Li*) on all individual pigs and weekly individual fecal samples for pooled PCR were collected and submitted to the University of Minnesota.

Results/ Discussion

Table 1 shows results for Week 4 post-challenge. There were no other significant differences ($p<0.05$) between CC and T treatment groups during any other periods for these parameters. The percent of mortality and removals were different due to treatment.

Table 1. Week 4 Parameters*

	CC	T
Behavior	1.0702a	1.0000b
Fecal Consistency	1.4429a	1.0750b
Body Condition	1.1202a	1.0250b
ADG	1.0922a	1.3967b
F:G	2.4567a	2.0897a
ADFI	2.4803a	2.8907b

*Different letters in the same row are significant ($p<0.05$).

Table 2. Mortality and Morbidity, Day 1-140.*

	CC	T
Mortality, %	7.08a	0b
Removals + Mortality, %	17.50a	1.67b

*Different letters in the same row are significant ($p<0.05$).

The dose used in this study was 10^4 to 10^5 lower that is typically used in gut homogenate challenge models.[3] Clinical signs using the normal dose are typically seen within 14 days post challenge. Clinical signs were not seen until week 4 post-challenge in this trial, suggesting that a lower challenge dose may prolong the time until onset of clinical signs, which may support previous research.[4] Tylan improved performance in pigs infected with ileitis at a subclinical level.

References

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[3] Armbruster, G et al. Proc 18th IPVS Congress 2004. vol 2 p 579

[4] Collins, A et al. Proc. AD Leman Swine Conference 2001. p 115.