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Evaluation of the use of *Lawsonia intracellularis* Indirect Fluorescent Antibody Test (IFA) in a Large Production System

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Introduction: *Lawsonia intracellularis* (Ileitis) has been identified as one of the major causes of enteric disease; therefore, production losses in the grow/finish phase of swine production. Swine practitioners have worked diligently to develop and implement strategies for improved diagnosis and control, while scientists continue to attempt to answer questions concerning epidemiology, pathogenesis, and immune response. While some questions remain unanswered, there has been significant advancement in the knowledge necessary to control the disease. The fundamental principle of control is obtaining an accurate understanding of the pattern of transmission throughout the various populations of pigs within a production system. The objective of this study is to evaluate the application and interpretation of a *Lawsonia intracellularis* IFA serologic assay in a commercial swine production system.[1] The following report describes our findings.

Materials and Methods:

A. Sow Units

Three sow units were profiled. In each unit, three groups of females were bled at mid-gestation, prior to farrowing, and post-weaning, and followed for one complete cycle. At each of the three time periods 45 females were bled per group per sow unit (n=135). Efforts were made to serially bleed the same animals at each time period. If unable to locate a specific individual, an alternative was selected from the same breeding group (having similar immunologic exposure), to maintain a consistent number of animals sampled per group. In one unit the post-weaning bleed was not done for one group.

B. Nursery Phase of Production

Three AI/AO nurseries were selected for study. Each nursery contained one weaning group (maximum age variation = 5 days). In each nursery, 50 pigs were randomly tagged and serially bled. **Nursery A** pigs were bled at entry, two weeks into the nursery, and exiting the nursery (three weeks later). **Nursery B pigs** were bled two weeks into the nursery and exiting the nursery. **Nursery C** pigs were bled exiting the nursery. All three groups were followed and bled every four weeks in the finisher until slaughter.

C. Grow/Finish Phase of Production

Three groups of 50 pigs that were tagged in nurseries were serially bled in finishers as detailed above. In addition, five other grow/finish barns were serially evaluated every 4 weeks until marketed. Sampling began in Barn A at entry, in Barn B, 4 weeks post-entry, in Barn C, 8 weeks post-entry, in Barn D, 12 weeks post-entry, and Barn E, 16 weeks post-entry; with n=50 for each group.

Results:

Figure 1 represents the number of animals testing *L. intracellularis* IFA positive for each of the three sow units combined during each testing period; (n=45 for each testing period in each sow farm). These results clearly show a low sero-prevalence in the sow herd, suggesting a relatively stable sow population with little *Lawsonia* activity in this production phase. These results indicate animals previously exposed and subsequently demonstrating titer decay to a negative status. The mid-

gestation bleeds seem to have the largest number of sero-positive animals, a time when the animals are moved (movement perhaps being a causal factor in this system).

Figure 2 represents the results for animals with testing beginning in the nursery phase of production and continued through the grow/finish phase of production. The results of the nursery profiles demonstrate no seroconversion to *L. intracellularis*. The nursery profile is indicative of a relatively stable population with very little *Lawsonia* activity in the nursery phase of this system. A possible exception is nursery C-9 where pigs are sero-negative at exit of the nursery, but are sero-positive in the finisher three weeks later. Seroconversion with the *Lawsonia* IFA assay occurs two to three weeks post-exposure. This could indicate that some exposure is occurring in the late stages of nursery C-9, or immediately upon arrival at the grow/finish phase.

Figure 3 shows results for groups beginning in the grow/finish phase. Seroconversion occurs primarily in this phase, which correlates with the expression of clinical disease. Seroconversion in this case is occurring approximately 8 weeks post-entry, suggesting that exposure to *Lawsonia* occurs 5-6 weeks post-entry.

Summary: The *Lawsonia* IFA assay is a useful tool, building serologic profiles to understand the epidemiology and transmission of this agent. It assists the practitioner in identifying points of exposure and potential risk or causal factors, allowing the development of strategic intervention strategies for control and prevention.

References: Knittel Jeffrey P., MS, et. al.; Evaluation of antemortem polymerase chain reaction and serologic methods for detection of Lawsonia intracellularis-exposed pigs. AJVR, Vol 59, No. 6, June 1998, p722-726.

Figure 1:

	Production Week						
Group	12*	16	20	21	24	26	29
A	W-0 (0%)			G-13 (9.6%)			F-0 (0%)
B	G-2 (1.5%)		F-1 (.7%)		W**		
C	F-0 (0%)	W-12 (8.9%)				G-17 (12.6%)	

*Baseline. W=wean, G=mid gestation, F=prior to farrow
** Scheduled bleed did not occur
Percentage positives per group in parentheses

Figure 3:

	Production Week				
Finisher	12*	16	20	24	28
E-120	14%				
D-29	4%	49%			
C-49	4%	74%	65%		
B-56	0%	12%	70%	76%	
A-80	0%	0%	32%	56%	22%

*Baseline

Figure 2:

Production Week													
Nursery	12*	13	14	15	16	17	18	19	20	21	22	23	24
A-8	0%N		0%N			0%N				0%F			
B-11	0%N		0%N				4%F				12%F		
C-9	0%N			2%F				84%F				72%F	
Production Week													
Nursery	25	26	27	28	29	30	31	32	33	34	35	36	37
A-8	18%F				14%F				16%F				20%F
B-11		34%F				28%F				20%F			
C-9			18%F				20%F						

*Baseline N = nursery phase F = grow/finish phase

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