

Health Challenges in Midwestern “Niche” Pork Production Systems

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Summary and Implications

Organic pork production is increasing in popularity in the Midwest. Little information is available to identify specific disease pressures associated with this unique method of pork production. This project was initiated to identify health challenges within these production systems to enable veterinarians to implement management plans specifically designed to combat the individual farms' pathogens while staying within the guidelines of the Niche production company.

This project was initiated in late 2005 and outlined two specific goals at inception. The first was to analyze Niche pork production and financial records. The second goal of the project was to identify herd health challenges through targeted diagnostic analysis.

26 producers representing 5 Midwestern states submitted samples for standardized diagnostic analysis to Iowa State University's Veterinary Diagnostic Laboratory (VDL). Internal parasites were present in all age groups. Ileitis (*Lawsonia intracellularis*) lesions were present in pigs as young as seven weeks old. Swine Influenza virus (SIV) levels ranged from 50-80% in the project's submissions.

Vaccination and wormer use in these herds is variable and the use of these products is not prohibited by most Niche marketing companies. Knowledge of what pathogens are present in Niche herds will better prepare veterinarians to control these problems.

Materials and Methods

Niche pork producers under contract with three Midwestern marketing companies were accepted into the monitoring program under the following guidelines: 1) they maintained accurate production and financial records, 2) they maintained ownership of the swine from conception to marketing, and 3) they had an established relationship with a local veterinarian with a working knowledge of swine diseases. Once enrolled, the producers received veterinary consultation and subsidized diagnostics.

A routine diagnostic profile was established by investigators at the Iowa State University Veterinary Diagnostic Laboratory (ISU VDL). This profile included serology samples from breeding stock (10), post-weaning pigs up to 13 weeks of age (10) and grower pigs (mid-phase,

approximately 15-18 weeks old (5) and market weight animals (5). Serological tests performed included PRRSV (Porcine Reproductive and Respiratory Syndrome virus) ELISA (enzyme linked immunosorbant assay), SIV (swine influenza virus) HI (hemagglutination inhibition) (H1N1 and H3N2) on all animals and PPV (porcine parvovirus) HI on sows only.

Tissue based diagnostics were targeted from each enrolled herd to include a representative sample of three pigs from each of the phases: suckling, nursery, and grower-finisher. Full sets of tissues were collected and submitted by the local veterinarian to the ISU VDL. Cases were labeled for inclusion into the project and routed to a single diagnostician to provide consistency of analysis. Pathogens targeted through the tissue diagnostics included: PRRSV, *M. hyopneumoniae*, SIV, PCV2 (Porcine Circovirus 2), *Lawsonia intracellularis* (ileitis), rotavirus, TGE (transmissible gastroenteritis), *Clostridium perfringens* and *dificile* and common bacterial pathogens of swine.

Fecal samples and skin scrapings from sows, nursery and finisher animals were evaluated for internal and external parasites. Parasitic infections of suckling pigs were analyzed as part of the tissue diagnostic submission protocols.

Data was summarized using standard database and spreadsheet programs (Microsoft® Excel and Access)

Results and Discussion

Production Practices

Twenty-eight producers from across 5 Midwestern states were enrolled in the diagnostic analysis portion of the project. Producers from Illinois, Iowa, Kansas, Minnesota, and Nebraska were represented. Herd sizes ranged from 30 sows to more than 200 sows, with an average herd size of 70 sows. A variety of housing and bedding options were utilized by the enrolled producers including: straw, corn stalks, dirt and concrete. Approximately 33% of the producers purchased outside breeding stock and utilized a 30 day isolation period. The remaining producers bred and raised internal replacement stock. All but one producer utilized single-site production. This producer shared finishing space with another producer and co-mingled their pigs on one site. All of the enrolled producers participated in other agricultural enterprises and were not swine exclusive farmers.

Herd health pressures reported by the producers as strong economic challenges included diarrhea (*E. coli* was separately listed as a specific concern), ileitis, respiratory disease and parasites. The majority of producers reported vaccination programs in place for sows and nursery pigs. The pathogens targeted included: Parvovirus, *Leptospira* (the majority vaccinating for *L. bratislava*), *Erysipelas*,

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rhinitis, ileitis, Bordetella, Pasturella, E. coli, *M. hyopneumoniae*, and *H. parasuis*. Parasite control was in place on most herds utilizing standard anthelmintic methods although the age of administration was not identified. Few producers listed routine therapy procedures for treatment of acute disease states. The producers who did have treatment protocols in place utilized organic acids, copper sulfate, citric acid, electrolytes and Protimax L[®] as interventions for disease conditions.

Diagnostic Analysis

Year one of the project yielded diagnostic submissions from 23 of the original 28 producers. Two producers removed themselves from the study due to personal reasons. Fourteen producers submitted the required serology samples. Of these, 17% of sow herds, 17% of nursery pigs and 23% of finishing pigs had ELISA titers to PRRSV. (Table 1) PRRS virus was detected by serum PCR (polymerase chain reaction) testing in suckling pigs in only one of sixteen herds that submitted farrowing samples. 50-60% of post-weaning animals and 79% of sows had HI titers to SIV. (Table 1)

Finishing pigs had both the highest percentage of positive fecal samples (83%) and the heaviest average parasite burden. Seventy percent of sow herds showed the presence of parasitic infestations. (Table 1) Parasite species isolated included: Ascarids, Strongyles, Eimeria, Isospora and Cryptosporidium. Ascarids were the most common parasite identified.

Tissue submissions were received from 14 of 26 producers. PCV2 was identified in 38% of the post-weaning

submissions. PCV2 was present with and without the associated tissue related changes associated with PCVAD (Porcine Circovirus Associated Disease). *M. hyopneumoniae* was identified by IHC (immunohistochemistry) testing in 21% of the nursery submissions and 30% of the finisher submissions. This compares to 10% of general tissue submissions with *M. hyopneumoniae* infections. *Lawsonia intracellularis* was detected more commonly in nursery pigs than in finishing pigs, and was identified in animals as young as 7 weeks of age.

Discussion

Compared to diagnostic laboratory data, which primarily reflects disease incidence in conventionally raised pigs; the rate of PRRSV infection was lower in Niche herds, Mycoplasma infection and parasite infection rates were higher, and Lawsonia typically occurred in younger animals. The goal of this program was to highlight disease pressures and provide information to veterinarians and producers to facilitate development of targeted health management plans in those systems where traditional treatment options are limited. Armed with diagnostic results specific to each herd; comprehensive vaccination, biosecurity and treatment protocols can be drawn up and put into action.

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Figure 1.

