

## Objective

To collect cross-sectional fecal samples of all phases of production to obtain a representative image of the internal parasite burden of the farm. A fecal egg count was used in conjunction with on-farm observation to make recommendations that will benefit the herd.

## History

MAE Farms Meats is a 73 acre pastured farrow-to-finish swine farm started in November of 2004. Genetic lines include Chester, Duroc, Hampshire, and Berkshire breeds. Market hogs are sold at the State Farmers Market in Raleigh, NC. Anthelmintics have not been used in about a year and a half. The only memorable outbreak the farm has had was in spring of 2005, when Erysipelas and E. coli hit at the same time. Vaccines have since been discontinued, and have not been used for five years.

## Management Practices

MAE Farm Meats has been anthelmintic free for over a year and a half now. This transition was due to the removal of Ivomec as a swine feed additive from the market. Since going off the feed additive, the farm has noticed a decrease in body condition of most of the sows during this past winter. The sows are also older than previous winters, so this could be playing a role. No pour-ons or injections have been added to replace the feed additive. Antibiotics are rarely used, but when they are necessary, penicillin is used and observed to be highly effective.

Based on a sow's production, temperament, and health, she is selected to breed and is placed in a pen with a boar and multiple sows. The sows are placed in farrowing huts just prior to farrowing. Once the piglets are a few weeks old, the sow and young are moved to the weaning pen with several other sows and their litters. No vaccines or iron shots are given at this time; the only processing done is castration. The piglets are not weaned until ten weeks of age which reduces stress and the need for antibiotics. A common predator at this age is the black vulture. The sows and piglets have a shelter with straw bedding which is never removed but new layers are added on top. The large dirt lot is bordered by trees, providing shade in the warmer months.

Post-weaning, the pigs are placed in a finishing pen which is a nearby dirt lot also bordered by forest. When they get closer to market weight, they are placed in another pen until being sent to processing at a separate facility. Minimal transitions between pens are made in order to reduce stress.

The farm also has a small herd of beef cattle which are used to mow down the overgrown grass lots.

An aerial map was used to demonstrate the pens where feces were sampled and is illustrated in Figure 1 below. The labeled names are repeated in Table 1 in the fecal analysis section.

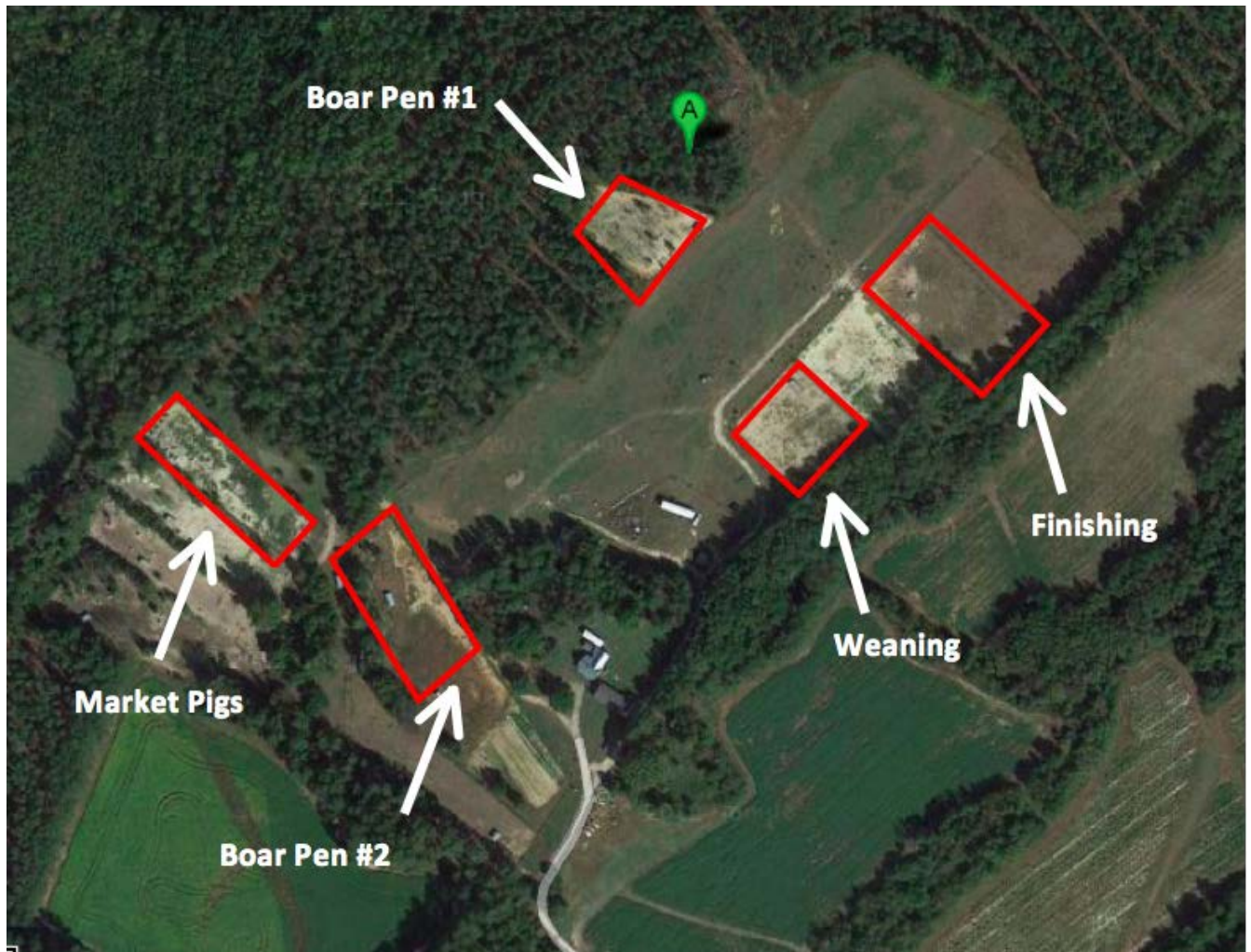


Figure 1. Aerial Map of MAE Farm locating pens where fecal samples were collected.

### Health Concerns

Parasitic concerns based on visual observation include lice (*haematopinus suis*), which was observed mainly in the farrowing huts. With the elimination of Ivomec in the feed, other methods need to be implemented in order to reduce louse load in this stage of production. The farmer also suspects a high internal parasite load on the farm because some of the sows and one of the boars (Tyler) have not maintained their body condition as well this season as they have in the past. These animals are getting older, though, and age may be a factor in their condition.

Non-parasitic concerns include lameness. Two pigs were observed severely lame, with extremely swollen, non-weight bearing limbs. Measures should be taken to reduce or eliminate the suffering of these affected pigs. Euthanasia should be considered as a viable option.

## Fecal Analysis

Fecal samples were taken from five separate pens shown in Figure 1. The only pen with ascaris eggs per gram (epg) above single digits was the market weight pen and these levels of ova are often reported as “false positives”; i.e., not due to patent infections but pass-through eggs ingested but not mature enough to hatch and infect (Boes et al, 2010; attachment). The parasites found were Strongyle type ova, coccidia, and *Ascaris suum*. The life cycle of *Ascaris suum* is shown in Figure 2 below. The larvae or larvated eggs are ingested by the pig followed by migration of the larvae through the liver and lungs. Ascarid ova need warm temperatures to develop into an infective state requiring at least 2 weeks, so infection is typically higher in the summer months. Granulomatous scarring of the liver (white spots seen at slaughter) is considered definitive evidence of infection, due to the migration of the larvae. Therefore, even if a pig does not have mature Ascarids producing ova in their gastrointestinal tract (and therefore detectable ova upon fecal analysis), if they were infected by the larvae, white spots would be seen upon liver inspection. Fortunately, MAE farms has only had a handful of livers condemned over their time in operation suggesting minimal infection with Ascarid larvae.

### **ASCARIS SUUM LIFE CYCLE**

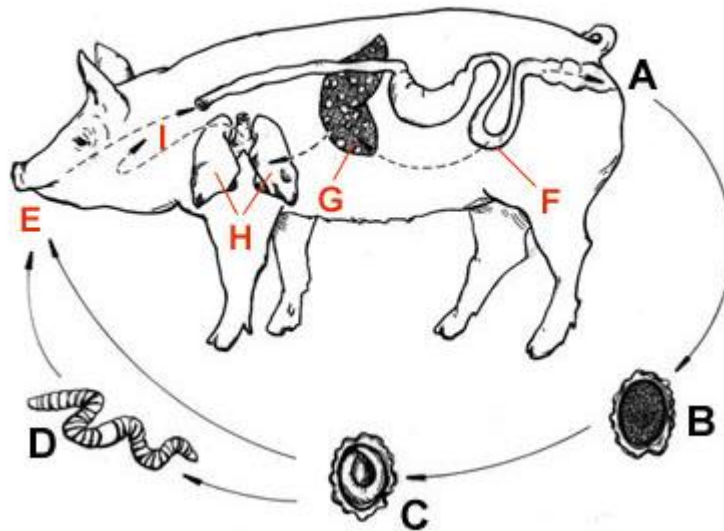


Figure 2: Life cycle of *Ascaris suum*.

	<b>Strongyle Type Eggs (EPG)</b>	<b>Coccidia</b>	<b>Ascarids (EPG)</b>
<b>Weaning Pen</b>			
1	<b>64</b>	-	-
2	-	-	-
3	-	-	-
4	-	-	-
5	-	-	-
6	-	-	-
7	<b>1</b>	<b>+</b>	-
8	<b>1.5</b>	-	-
9	-	-	<b>0.5</b>
10	-	-	-
11	-	-	-
12	-	<b>+</b>	-
<b>Finishing Pen</b>			
1	<b>8</b>	-	<b>0.5</b>
2	<b>1</b>	<b>+</b>	<b>4.5</b>
3	-	-	<b>1</b>
4	<b>1</b>	<b>+</b>	-
5	-	-	-
6	-	-	-
7	-	-	-
8	<b>2.5</b>	<b>+</b>	-
9	-	-	-
10	-	-	-
11	-	-	-
<b>Boar Pen 1 (Tyler)</b>			
1	-	-	-
2	-	-	-
3	-	-	-
4	-	-	-
5	-	-	-
<b>Boar Pen 2</b>			
1	-	-	-
2	-	-	-
3	-	-	<b>0.5</b>
4	<b>1</b>	-	-
<b>Market Pen plus Unwelcome Boar</b>			
1	-	-	-
2	<b>2.5</b>	-	-
3	-	-	<b>18</b>
4	<b>2</b>	<b>+</b>	-
5	-	-	-
6	-	-	<b>29</b>
7	-	-	<b>41</b>
8	-	<b>+</b>	<b>10</b>
9	-	<b>+</b>	-
10	-	-	-
11	<b>4</b>	-	-
12	<b>95</b>	-	-

Table 1: Fecal analysis results showing parasite burden by pen.

## Recommendations

Given the overall health of the herd, lack of liver condemnations, and the long period of time since the last anthelmintic use, the low observed parasite loads are not likely causing a clinical problem at the current stocking density. A low level of non-resistant parasites on the pasture is desirable so that animals have a chance to build a natural immunity from this reservoir. This is generally not a problem in dirt-reared operations, given the longevity of ascarid eggs on pasture. Current research suggests that *Ascaris suum* is not as significant of a problem for dirt pen facilities as previously thought, and anthelmintic use does not affect average daily gain, feed conversion, or lean meat percentage. In the cited study, treatment with an anthelmintic only affected shedding of eggs, not scarring of the liver [1]. This study has been attached to this report.

MAE Farms mentioned using oregano oil in the feed, and asked if it could affect our results. A review of the current literature revealed that oregano supplementation has many clinically proven positive effects in swine, including improved feed intake, weight gain, feed conversion, and farrowing rate. Oregano oil is considered an appetite enhancer, digestion aid, and even has some antibacterial properties as a feed additive. However, the effect of oregano oil on parasites has not yet been studied, and thus we cannot say whether or not it has contributed to low levels of parasitism at MAE Farms [2].

Careful observation of the herd and fecal surveillance by a veterinarian should still be performed regularly. With the current stocking density and good pasture management practices, internal parasites do not seem to be an issue for MAE Farms. Difficulty maintaining body condition in select animals is likely due to increasing age, and if it becomes a significant problem, culling affected animals or a change in genetics should be considered.

### Sources:

[1] J. Boes et al. "Effect of *Ascaris suum* infection on performance of fattening pigs." *Veterinary Parasitology* 172 (2010) 269–276.

[2] P. Allan, G. Bilkei. "Oregano improves reproductive performance of sows." *Theriogenology* 63 (2005) 716–721.