

University of Missouri Extension

G2430, Reviewed October 1993

Common Internal Parasites of Swine

Robert M. Corwin
Department of Veterinary Microbiology
College of Veterinary Medicine

Roderick C. Tubbs
Swine veterinarian
Commercial Agriculture Program

Swine performance is influenced by internal parasites, most dramatically in the young, growing pig. Parasites reside in the stomach and intestinal tract of the pig, causing irritation, impaction, indigestion and lack of appetite. Parasites cause loss of nutrients from feed consumed by competing with the host, and by causing poor digestion, gut ulceration and even blood loss. Even small numbers of the large roundworm *Ascaris suum* can depress feed intake and daily gain and cause a depression in gain:feed ratio. Some worm parasites may be found in the lungs, where they interfere with respiration. This in turn may result in pneumonia.

Even though internal parasites are commonly associated with pasture and dry lot husbandry, some parasites such as *Isospora* (neonatal infection) may be present in total confinement. Ascarid infections frequently are found in finishing barns with concrete floors. The reason for continuing parasitism in these units is that transmission is by infective eggs and oocysts, which are difficult to keep out of any environment. Therefore, appropriate deworming schedules and sanitation are mandatory for parasite prevention programs.

There are only a few target parasites of concern, while several dewormers can be used effectively. The dewormers are usually broad spectrum in that most if not all of the worm parasites are removed, and they are safe and easily administered.

Large roundworms

Most hogs have *Ascaris* infections during their lifetimes. These roundworms are usually found in greatest numbers in pigs up to 2 to 3 months of age with a few in older pigs. Sows usually are not clinically affected, but serve as carriers. Roundworms are long (6 to 12 inches), stout, pinkish worms, sometimes with curved tails. The adults live in the small intestine, grazing on the gut lining and ingesting particulate and liquid materials from digesting food.

The adult females deposit round, microscopic eggs. Each female lays thousands per day beginning about two months after the pig becomes infected. Eggs may survive for 10 or more years and are quite resistant to cold and disinfectants. They can be destroyed by high-pressure steam heat and sunlight. Because they are sticky, eggs are easily transported by cockroaches, beetles, flies, birds and workers' boots and clothing.

Eggs become infective after being outside the pig for one month. When another pig swallows them, they hatch in the stomach or small intestine. The tiny larva that emerges penetrates the gut wall and is carried to the liver through the bloodstream. In the liver, larvae migrate for one-half to one week and then are swept through the bloodstream to the lungs. From there, the larvae are coughed up, swallowed and returned to the small intestine, where they grow and mature within two months. Thus pigs may be 1-1/2 to 2 months of age

before eggs can be detected in fecal samples, but immature adult worms may be passed earlier. The significance of this is that clinical signs may occur before eggs are detectable in feces.

Several clinical events may occur in the infected pig. They include:

- Inflammation of the liver due to an allergic reaction to ascarid larva migration.
- "Milk spots" on the liver that usually disappear with time.
- Another allergic reaction occurs in the lungs as larvae move through the air spaces.
- The lung tissue becomes thick and wet, leading to inefficient respiration and "thumps." This process is made worse by dust, ammonia and bacteria.
- Colic or gut pain may result from worms in the small intestine grazing or nipping forcefully on the gut lining and stretching the gut wall as the worms grow.
- An impaction and even tearing of the gut may occur.
- Often most obvious to the producer is competition of the pig and its roundworm burden for nutrients, so that wormy pigs are set back and appear unthrifty.
- Otherwise healthy pigs with a low worm burden may appear normal, but performance as judged by feed conversion may be depressed.

A United States study in 1987 showed losses due solely to lowered feed conversion from low-level ascarid infections were \$155 million. Certainly, losses were far greater when scarred livers and other infections are taken into account.

Your veterinarian can diagnose this infection by taking fecal samples for microscopic examination. Whenever a pig dies, your veterinarian should necropsy it to determine parasitic infections by presence of ascarids in the small intestine and by milk spots on the liver surface.

Whipworms

The whipworm *Trichuris suis* is slender, 2 to 2-1/2 inches long, and found in the cecum and upper large intestine. The slender head end of this small worm penetrates the gut lining, causing irritation and some blood loss. Female worms sporadically produce microscopic eggs in pigs 3 months of age and older. Eggs are infective and capable of surviving long periods in soil or on dirt- and feces-covered slatted and concrete floors. When pigs ingest eggs, infections remain in the intestinal tract of the pig and larvae do not migrate. There is a period of three months from the time of infection to passing eggs; bloody scouring may occur during this period as well as during egg production.

Nodular worms

The name "nodular worm" stems from the nodules produced by a larval stage of *Oesophagostomum*. These nodules are formed as a fibrotic host response in the walls of the cecum and colon in an attempt to wall off the larvae. Larvae that escape nodule formation emerge in the gut and mature into adults less than 1 inch in length. The microscopic eggs are passed in the feces and hatch outside the pig. They survive on pasture for up to one year. Pigs usually become infected with these larvae while feeding. The worms are confined to the gut. Condemnation of the large intestine or colon at slaughter is an economic loss when these are used for sausage casings. In the live pig, scouring may result from infection.

Threadworm

This tiny intestinal worm, *Strongyloides*, occurs commonly in baby pigs. The adults (females only) are

practically microscopic and live in the wall of the small intestine. Microscopic eggs are passed in the feces of pigs as young as 4 days of age. Farrowing pens, dirt lots and pastures become contaminated; larvae that are hatched may be ingested in water and feed or may penetrate skin. Most importantly, these infective larvae may be passed in sow colostrum so that infection takes place at first nursing. Prenatal infections can also occur. Heavy infections may cause intensive scouring in neonatal pigs, resulting in acute dehydration. Protective immunity develops rapidly in pigs not overwhelmed by this early infection.

Kidneyworms

The kidneyworm, *Stephanurus*, is a short (1 inch), stout, black and white worm found in the fat around the kidney and sometimes in the kidney. Mature infections are found primarily in sows, since it takes nine months to one year after infection before eggs are produced by adult kidneyworms. Because infection occurs in and around the kidneys, eggs are passed in the urine.

Wooded lots and shaded farrowing pens often become contaminated areas where larvae hatch from eggs and enter the soil. Pigs may become exposed to infective larvae by ingestion, skin penetration and ingestion of infected earthworms. Larvae then move from the small intestine and eventually into the liver, where they remain for two to four months.

Other organs such as the lungs and spleen may also be infected. From the liver, larvae migrate to areas around and in the kidneys and even into back muscle. Most of the damage is found in the liver, which becomes heavily scarred, and in nearby muscle tissue. Outbreaks have occurred in southern Missouri with both breeding stock and market-weight pigs involved.

Lungworms

Lungworms, *Metastrongylus*, are short (1 to 2 inches), slender and white and occur in clusters deep in the respiratory tract (bronchioles). Eggs are coughed up, swallowed and passed in the feces. Lungworm eggs are ingested by earthworms, allowing easy exposure to hogs that root in the soil and eat infected earthworms. Larvae are circulated by the lymphatic system from the small intestine, through the heart and then into the lungs. "Thumping" or coughing with pneumonia is common in infected pigs. Pigs may pass eggs one month after infection. Pigs on pasture are at highest risk. Lungs should be dissected at postmortem to determine the presence or absence of lungworms.

Prevention

Parasite control should include good sanitation. Good nutrition is critical to the pig's ability to mount an immune response and maintain performance in the presence of parasites. Since roundworms and whipworms have transmissible eggs, indoor facilities need to be well-cleaned and traffic minimized. Gilts should be kept off of contaminated lots, and weaned pigs kept away from older breeding stock. When dry lots, pastures and wooded areas are used for hog production, prevention is chiefly by treatment, but changing sites away from contaminated areas may help. Unfortunately, roundworm and whipworm eggs persist for long periods, kidneyworm and lungworm larvae are found in earthworms, and *Strongyloides* may be passed in colostrum. Management can be improved by working with your livestock Mu Extension specialist or your veterinarian.

Treatment

Those dewormers that are currently approved for use are effective and usually safe when given according to

label directions. These include ivermectin (Ivomec[®]), fenbendazole (Safe-Guard[®]), levamisole (Tramisol[®], Levasole[®]), pyrantel (Banminth[®]), dichlorvos (Atgard[®]) and piperazine. Their activity varies somewhat, so refer to Table 1 for the appropriate use.

Table 1
Dewormers for common parasites

Worms and stages	Compound
Ascarids (adults)	All of the above
Ascarids (migrating larvae)	Fenbendazole
Ascarids (infective larvae)	Fenbendazole, pyrantel
Whipworms	Fenbendazole, dichlorvos
Nodular worms	All of the above
Lungworms	Fenbendazole, ivermectin, levamisole
Kidneyworms (adult)	Fenbendazole, levamisole
Kidneyworms (larvae in liver)	Fenbendazole
<i>Strongyloides</i>	Levamisole, ivermectin

The deworming schedule should include prebreeding for all breeding stock and pre-farrowing for gilts and sows, prevention of *Strongyloides* and roundworms in baby pigs, and one or more dewormings in weanling and growing pigs. Specific strategic schedules should be arranged with your veterinarian.

Formulations for group administration are provided as well as for individual treatment. Remember to use only label-approved drugs for label-approved routes of administration. Use approved formulations and appropriate drugs for the target parasite species and stages.

Coccidia

Neonatal (baby pigs) coccidiosis caused by *Isospora suis* is found wherever pigs are raised in confinement. Clinical signs of yellowish or gray pasty to liquid diarrhea appear at 1 to 2 weeks of age with dehydration evident even though nursing continues. Infection occurs in cells lining the small intestine. Oocysts (microscopic egglike forms) are passed five days after infection. Oocysts mature in 12 hours in the farrowing crate, and disease and mortality are directly proportional to the number of infective oocysts ingested. There has been no good evidence that sows are carriers and pass oocysts to their piglets. The source for this coccidian is still not known.

The other coccidia, *Eimeria*, which are found in weanling and older pigs, apparently cause little or no damage. Differentiation of *Isospora* from *Eimeria* can be made microscopically by your veterinarian but coccidiosis in baby pigs is apparently *Isospora* only. Unfortunately, none of the anticoccidial drugs is effective against *Isospora*, but sanitation of farrowing crates by thorough cleansing can be successful in its control. Control is best achieved by:

- Thorough cleaning and sanitation between each farrowing
- Monitoring of movement of personnel and supplies
- Control of pests and rodents to reduce mechanical transmission of the oocysts.

Related MU Extension publications

- G2507, Herd Management for Disease Prevention
<http://extension.missouri.edu/publications/DisplayPub.aspx?P=G2507>
- G2508, Herd Health Programs for Swine Seedstock Production
<http://extension.missouri.edu/publications/DisplayPub.aspx?P=G2508>

Order publications online at <http://extension.missouri.edu/explore/shop/> or call toll-free 800-292-0969.

UNIVERSITY OF MISSOURI



■ Issued in furtherance of the Cooperative Extension Work Acts of May 8 and June 30, 1914, in cooperation with the United States Department of Agriculture. Director, Cooperative Extension, University of Missouri, Columbia, MO 65211
■ an equal opportunity/ADA institution ■ 573-882-7216 ■ extension.missouri.edu