

Pig parasite diagnosis

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Parasites in swine have an impact on performance, with effects ranging from impaired growth and wasteful feed consumption to clinical disease, debilitation, and perhaps even death. It is particularly important to diagnose subclinical parasitism, which can have serious economic consequences and which should be treated with ongoing preventive measures.

Internal parasitism is caused by nematode roundworms and coccidia in the gastrointestinal tract, lungworms in the respiratory tract, and by ectoparasites. The most commonly encountered gastrointestinal parasites are the large roundworm *Ascaris suum*, the threadworm *Strongyloides ransomi*, the whipworm *Trichuris suis*, the nodular worm *Oesophagostomum dentatum*, and the coccidia, especially *Isospora suis* and *Cryptosporidium parvum* in neonates and *Eimeria* spp at weaning.

Diagnosis of internal parasites is best accomplished by fecal examination using a flotation technique and/or by necropsy. Although there are several flotation techniques, the net result is the microscopic appearance of nematode eggs and of coccidian oocysts. Fortunately, identification is relatively easy because pig parasite eggs and oocysts have such distinctive appearances. However, you should also consider size, so that you don't incorrectly identify artifacts--e.g., pine pollen--as eggs. Use an ocular micrometer for measurements in microns (μm).

You should also take the age of the pig into account when identifying parasites. Some parasites occur most often or in greatest numbers in young pigs, e.g., *Strongyloides*, *Ascaris*, and *Isospora*, whereas *Oesophagostomum* is often found in adult pigs because they have little immune response to it. The type of management and husbandry, e.g., pasture versus confinement, may determine the species of parasite present as well. Ascarids are ubiquitous and are found in confinement-reared pigs as well as in pigs reared on dirt. Others, such as nodular worms, lung worms, and, in southern climates, kidney worm (*Stephanurus dentatum*), are associated with dirt lots and pastures.

Prepatent period--the time it takes for the parasite to develop to reproductive age and produce eggs or oocysts --is another important identification factor. These periods are fairly specific and have a bearing on how early eggs could be expected to be found in pigs by fecal examination. The infection is then dependent on the initial time of exposure

and the persistence or life span of the parasite.

Postmortem examination should reveal adult worms in their principal sites of infection, e.g., ascarids in the small intestine. Lesions associated with larval infection, such as nodules of *Oesophagostomum* in the colon may not have larvae present or apparent. Lungworms also have rather specific sites at least in young worm populations, viz., the bronchioles of the diaphragmatic lobes of the lungs.

All of these parasites are directly transmissible from the environment with ingestion of eggs or larvae. *Strongyloides* may also be passed in the colostrum or penetrate skin, and transmission of the lung worm and the kidney worm may involve earthworms.

Ascaris suum --"large roundworm"

(Figure 1A)

egg: 45-60 μm , yellowish brown, spherical, mammillated (Figure 1B)

egg development: 2-5 weeks with survivability up to 10-12 years

prepatent period: 6-10 weeks

site of infection: small intestine (Figure 1C) but may migrate into bile ducts, eosinophilic tracts in liver and lungs due to larval migration (Figure 1D)

adult size: 10-15 inches (25-40 cm)

life span of adult: 8-12 weeks

affected pigs: nursing to growing

Strongyloides ransomi--"intestinal threadworm"

egg: 50-55 μm , thin-shelled, ovoid, embryonated or larvated

egg development: 2-3 days but larvae may be passed in colostrum

prepatent period: 3-5 days, thus may be found in neonates with scouring

site of infection: small intestine with adult in tissue, adult seen in histosection

life span: 5-10 days

affected pigs: all ages

Trichuris suis--"whipworm"

(Figure 2A)

egg: 45 μm , yellowish brown, ovoid, bipolar plugs (Figure 2B)

egg development: 3 weeks, long survivability in environment

prepatent period: 6-7 weeks

site of infection: cecum, proximal colon

adult size: 2-3 inches (5-8 cm), long, whiplike anterior end imbedded in mucosa

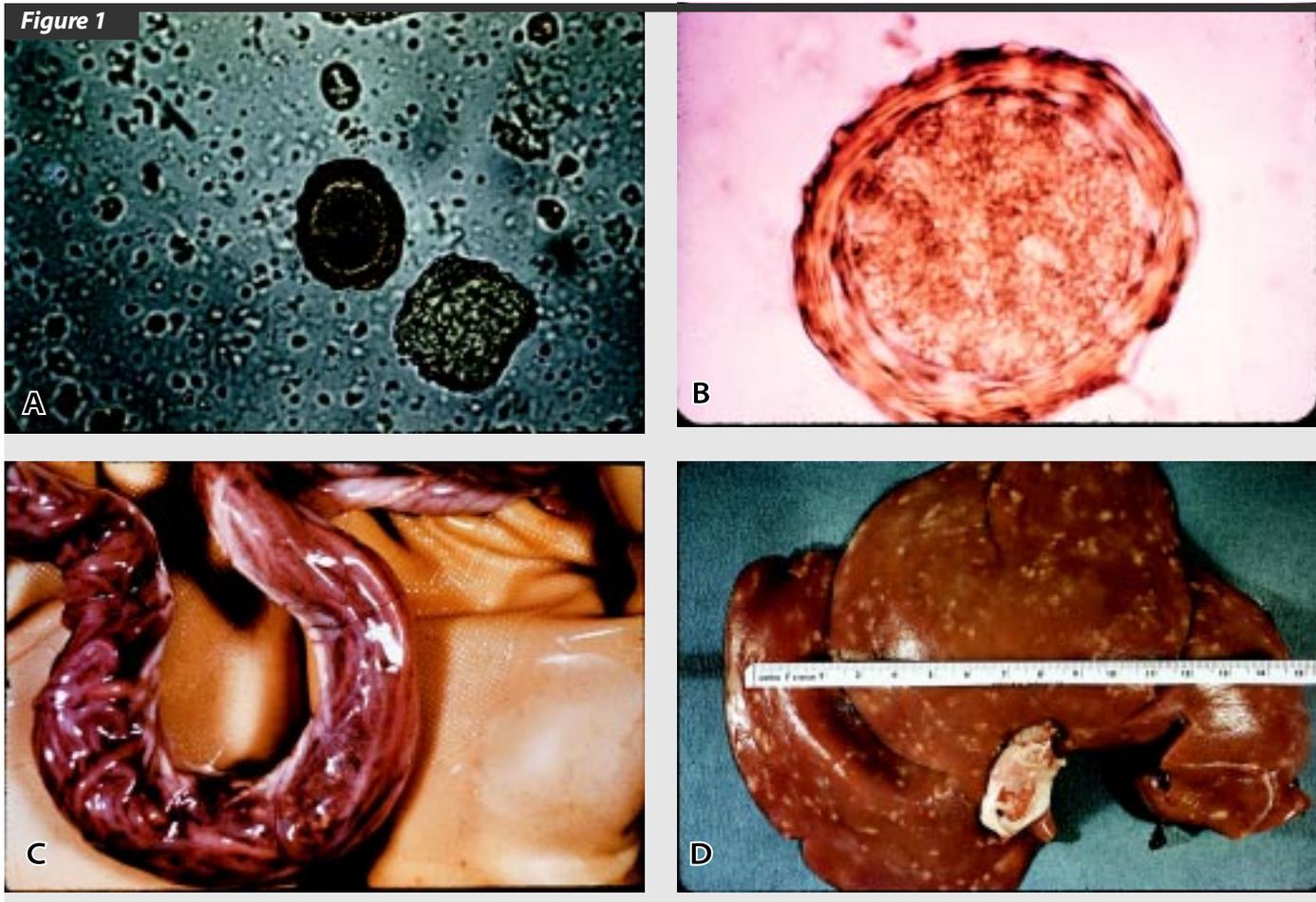
life span: 2-3 months

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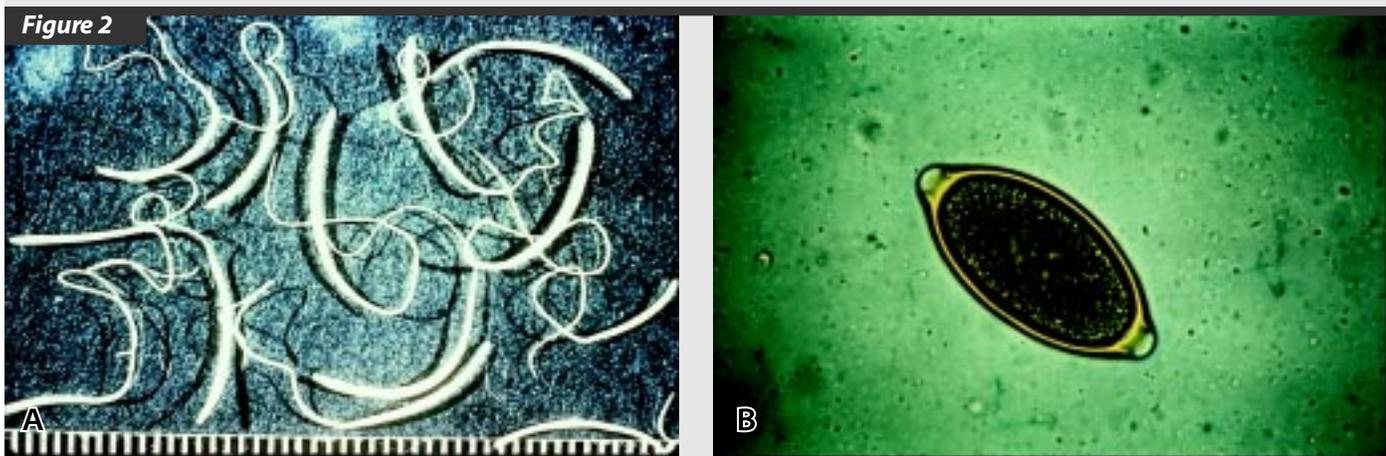
Diagnostic notes are not peer-reviewed.

This article is available on the AASP Web site at:

<http://www.aasp.org/shap/issues/v5n2/index.html>



Ascaris suum. 1A: large roundworm; 1B: egg; 1C: infection of small intestine; 1D: infection of liver



Trichuris suis. 2A: whipworm; 2B: egg

affected pigs: > 2 months

***Oesophagostomum dentatum*--“nodular worm”**

(Figure 3A)

egg: 90 × 40 μm, thin-shelled, morulated (Figure 3B)

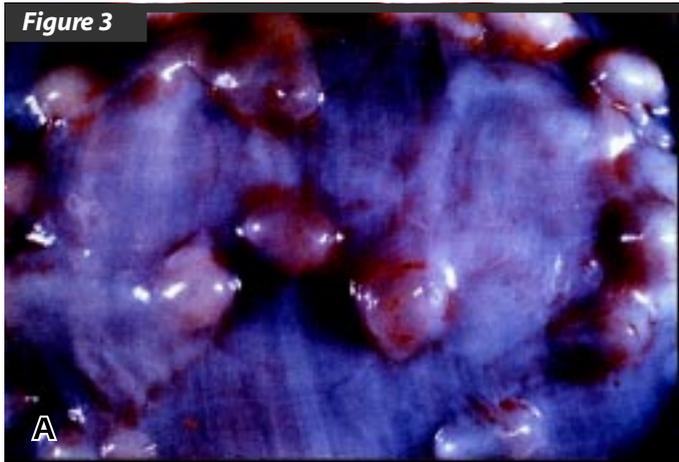
egg development: egg hatches in 1 week; infective larvae may survive up to 1 year on pasture

prepatent period: 4-6 weeks

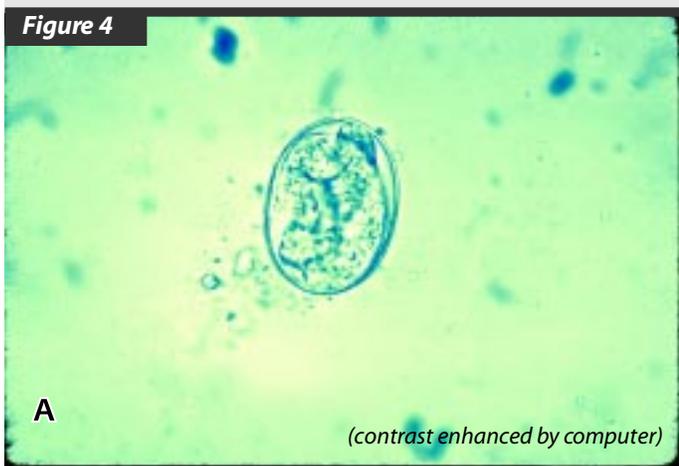
site of infection: colon

adult size: 0.5 inches (1.25 cm), larva-induced nodules

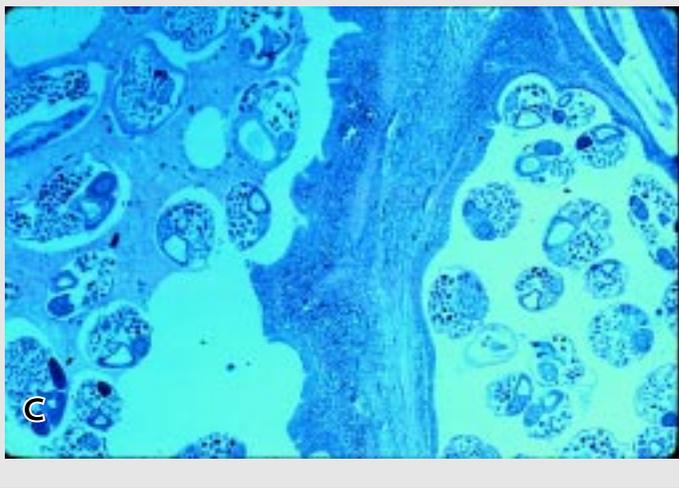
life span: 4-7 weeks



Oesophagostomum dentatum. 3A: nodular worm; 3B: egg



Metastrongylus spp. 4A: egg; 4B: infected lung; 4C: infected lung tissue



affected pigs: finishing and breeding adults

***Metastrongylus* spp.--"lung worm"**

egg: 40-50 μ m, shell often covered with mucus, developing larva within (Figure 4A)

egg development: egg hatches in earthworm or in soil

prepatent period: 4 weeks

site of infection: bronchioles of diaphragmatic lobes of lungs (Figures 4B and 4C)

adult: 1-2 inches (2.5-5 cm)

life span: several weeks dependent on immune response

affected pigs: adult and finishing hogs

***Stephanurus dentatus*--"kidney worm"**

(Figure 5A)

egg: 120 \times 70 μ m, thin-shelled, morulated; passed in urine (Figure 5B)

egg development: egg hatches in 1-2 days in soil or in earthworm

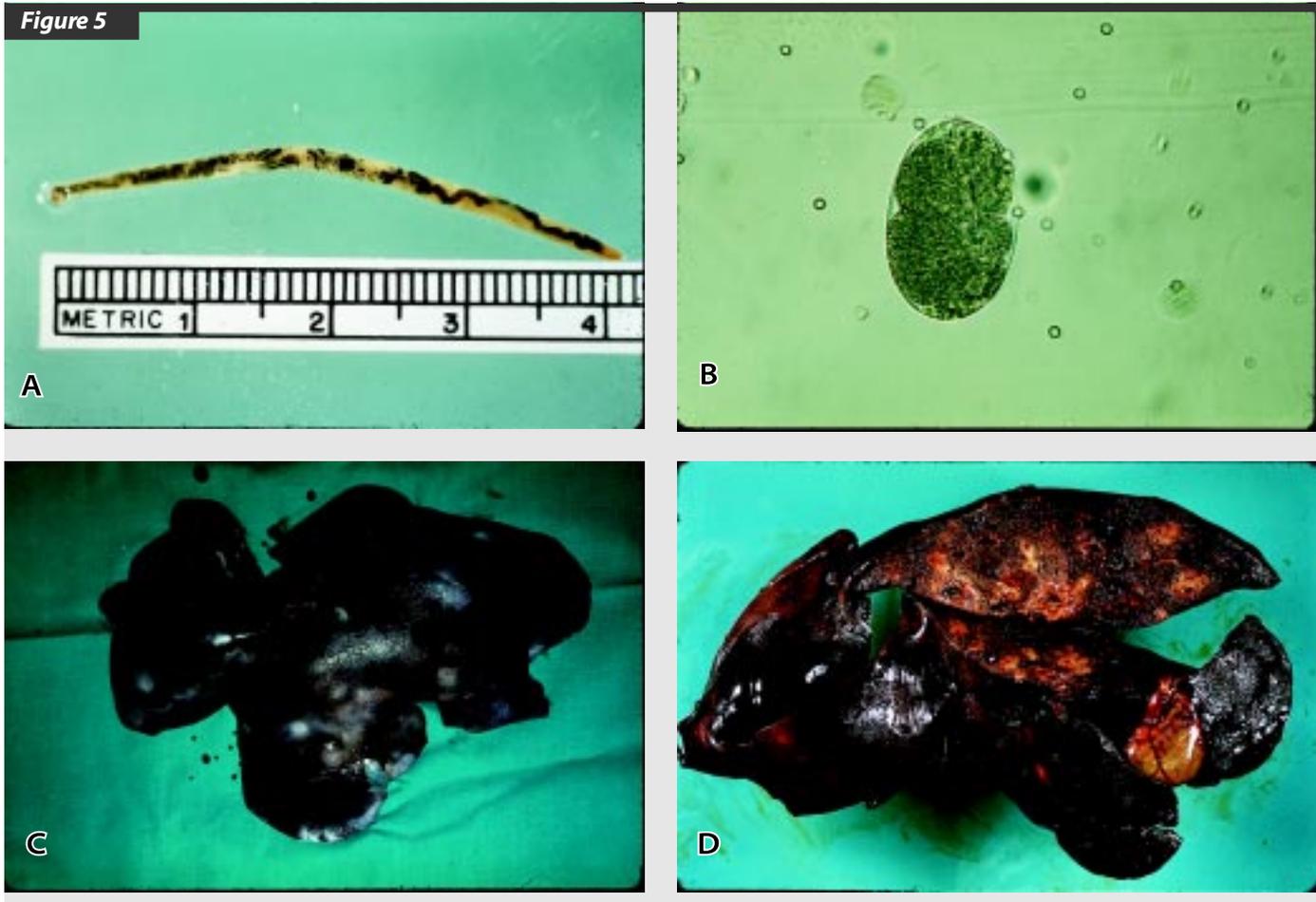
prepatent period: 9 months-1 year

site of infection of adult: perirenal fat; larvae in liver with abscessation likely (Figures 5C and 5D). Many ectopic sites such as lungs, spleen, back muscles

adult size: up to 1 inch (2.5 cm), black and white mottling

life span: based on egg shedding up to 3 years

Figure 5



Stephanurus denatus. 5A: kidney worm; 5B: egg; 5C: infected liver; 5D: infected liver -- internal section

affected pigs: breeding stock

***Isospora suis* -- "neonatal coccidiosis"**

oocyst: 25 μm , smooth shelled without cap, two sporoblasts in older specimens

development: infective following sporulation; transmission probably from sow

site of infection: small intestine

affected pigs: neonates and early nursing pigs

***Cryptosporidium parvum* -- "cryptosporidiosis"**

oocyst: 5 μm diameter, contains four sporozoites when passed

development: immediately infective; note cross-transmissibility from other host species

site of infection: jejunum, ileum, cecum, colon; in epithelial tips

affected pigs: 1- to 12-week-old piglets, but found in feces of 30-

week-old pigs

***Eimeria spp.* -- "coccidiosis" of older pigs**

oocysts: 20-30 μm , depending on species, may be translucent to brownish, with or without micropylar cap depending on species

development: infective following sporulation 6-9 days

affected pigs: weaning and older

An excellent reference for identification of nematode eggs and of coccidian oocysts is: Sloss, Kemp, and Zajac. *Veterinary Clinical Parasitology*, 6th edition. Iowa State University Press:Ames Iowa.

