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A Glimpse on Parasites affecting pigs

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Pig farming plays a significant role in India's rural economy, especially among small and marginal farmers and tribal communities. Pig farming in India is important because it provides income, nutrition and employment, which supports rural development and contributes to the livestock economy. With better management, breeding and marketing practices, it has the potential to become a major driver of rural prosperity. Several bacterial, viral, fungal and parasitic infections affect pigs. Among these, parasites such as helminths, arthropods, acarines and protozoa cause diseases in pigs. These parasitic infections can lead to poor growth, reduced feed efficiency and economic losses in pig production.

Helminth parasites affecting pigs

Helminths affecting pigs are round worms which include *Ascaris suum*, *Trichuris suis*, *Oesophagostomum dentatum*, *Strongyloides ransomi*, *Metastrongylus elongatus*, *Hyostrongylus rubidus, Stephanurus dentatus* and *Trichinella spiralis*. Acanthocephala or thorny headed worms also are commonly seen in pigs. *Cysticercus cellulosae*, the metacestode of *Taenia solium*, is commonly found in the muscles and other organs of pigs. The metacestode of *Echinococcus granulosus*, the hydatid cyst is also found in the organs of pigs. Common flukes affecting pigs include *Fasciolopsis buski* found in small intestine, *Paragonimus westermanii* found in the lungs and *Gastrodiscoides hominis* found in caecum and colon.

Round worms

Ascaris suum

It is the large round worm of pigs and is located in the small intestine. Transmission is by ingestion of embryonated eggs from contaminated soil or feed. The life cycle is direct and there is no intermediate host. The larvae migrate through the liver and lungs before returning to the intestine. Clinical signs include poor growth, unthriftiness, coughing and "thumps" (respiratory signs during larval migration). "Milk spots" on the liver which are fibrotic lesions are seen at slaughter. Intestinal blockage can occur in heavy infections. Regular deworming, proper hygiene and manure management to reduce egg contamination are essential to control this worm. Thorough scrubbing and washing of sows before farrowing is necessary for removal of eggs from the body of the sows.

Trichuris suis

It is called whip worm found in the cecum and colon. Transmission is by ingestion of infective eggs from the environment. Clinical signs include diarrhea (which may be bloody), weight loss and poor feed conversion. Anthelmintics are effective against whipworms. Cleaning and resting pens will help to control the infection.

Oesophagostomum dentatum

It is called nodular worm found in the large intestine. Transmission is by ingestion of infective larvae from contaminated soil. It causes nodules in the intestinal wall. Diarrhea and poor weight gain are prominent clinical signs. Pasture rotation and deworming helps to prevent the infection.

Strongyloides ransomi

It is called thread worm found in the small intestine. Transmission is through penetration of larval stages through skin or oral route or via sow's milk. It primarily affects piglets. It causes diarrhea, dehydration and sometimes death in neonates. Control is by treating sows before farrowing and by maintaining clean and dry farrowing areas.

Metastrongylus elongatus

It is called lung worm and is located in the bronchi and bronchioles. Earthworms act as

intermediate hosts. Clinical signs include coughing, dyspnoea and reduced growth. Regular deworming and preventing pigs from rooting in contaminated soil will help to prevent the infection.

Hyostrongylus rubidus

It is called red stomach worm and is located in the glandular portion of the stomach. Infection is common in outdoor pigs and pasture-raised pigs. Clinical signs include anemia, weight loss and decreased appetite. Regular deworming and avoiding overgrazing in pastures will help in control.

Stephanurus dentatus

It is called kidney worm of swine and is located in the perirenal fat, pelvis of kidney and wall of ureters. Infection is by oral route, skin penetration and ingestion of infected earthworms which act as intermediate host. Clinical signs include temporary subcutaneous nodules and precrural lymph node enlargement which causes stiffness of legs and posterior ataxia. Eggs can be detected in urine and worms can be found during necropsy. Pig pens should be drained properly to prevent infection.

Trichinella spiralis

It is called garbage worm. Lemon shaped muscle cysts are seen in pigs and it is zoonotic. Ingestion of undercooked pork or rodents can lead to infection in human beings.

Acanthocephala or Thorny headed worm infection in pigs

The thorny-headed worm, *Macracanthorhynchus hirudinaceus*, is an intestinal parasite of pigs that attaches to the small intestine using a spiny proboscis. Pigs become infected by eating beetles that act as intermediate hosts and the resulting infection can cause economic losses due to weight loss and slowed growth in the animals. The worms can also damage the intestine, causing inflammation, nodules, and potentially leading to a perforation in severe cases. The most effective way to prevent infection is to prevent pigs from accessing soil that may contain infected beetles. Pigs raised in confinement are typically free of this parasite.

Metacestodes in pigs

Pigs act as intermediate host for the human tapeworm *Taenia solium* and the larval form *Cysticercus cellulosae* (causes cysticercosis) are found in the muscles and organs of pigs and infected meat is called “measly pork”. Proper sanitation and avoiding human fecal contamination are essential to control this infection.

The metacestode of *Echinococcus granulosus*, the hydatid cyst is also found in the organs of pigs.

Trematodes in pigs

Fasciolopsis buski

It is called giant intestinal fluke and is seen in the intestine of pigs. Infection occurs when pigs ingest contaminated aquatic plants with encysted metacercariae. In the pig's intestine, the larvae mature into adult flukes, which can cause abdominal pain, diarrhea, and weight loss, malnutrition and malabsorption. Proper disposal of human and animal waste is important in control of this infection. Feeding of raw aquatic plants should be avoided. Regular deworming of pigs in endemic areas help in prevention of this infection.

Paragonimus westermanii

It is called lung fluke seen in the lungs of pigs. The infection occurs when pigs consume raw or undercooked crustaceans (like crabs or crayfish) that contain the infectious larval stage metacercaria of the lung fluke. This can lead to parasitic pneumonia in the pig's lungs, causing lesions and other symptoms. Strategic use of anthelmintic medications and management practices that prevent pigs from accessing intermediate hosts, such as raising pigs on concrete floors or using pasture rotation to reduce environmental contamination will help in control of the infection.

Gastrodiscoides hominis

It is a parasitic fluke that naturally inhabits the colon of pigs. Infection occurs by ingestion of molluscs containing the metacercarial stages. In pigs, symptoms can include malnutrition, anemia and general poor health. Good hygiene in pig farms help to prevent this infection.

Diagnosis of endoparasitic infections in pigs:

Endoparasitic infections in pigs can be diagnosed by history, clinical signs, examination of faecal samples for eggs and

lesions can be observed during post mortem examinations.

Prevention and control of endoparasitic infections in pigs:

Endoparasitic infections in pigs can be controlled by strategic deworming (based on age and housing system), good sanitation and hygiene (clean pens, remove manure, disinfect pens regularly), proper disposal of faeces, good nutrition to improve resistance, pasture management (rotation, rest), all-in/all-out production to break life cycles, avoiding overcrowding, rodent and insect control and regular monitoring of health status of pigs with routine fecal exams. Regular check-up of pigs for endoparasites by a veterinarian and proper administration of anthelmintics for specific worm problems under the guidance of veterinarian is highly essential.

Ectoparasites in pigs

Ectoparasites live on the skin or hair of pigs, feeding on blood, skin, or other tissues. They can cause irritation, reduced growth rates, poor feed conversion, and transmit diseases. Mites, lice, flies, ticks and fleas are the major ectoparasites infesting pigs.

Mange Mites

The sarcoptic mange mite *Sarcoptes scabiei var. suis* causes scabies in pigs. It is a microscopic mite that burrows into the pig's skin. It is the most common and economically important ectoparasite of pigs. Transmission is by direct contact with pigs and through contaminated equipment or housing. Clinical signs exhibited by infested pigs include intense itching and rubbing, thickened, scaly skin (especially around ears, neck, and shoulders), reduced weight gain and feed efficiency, poor hair coat and restlessness. Treatment can be done by injectable or pour on acaricides, cleaning and disinfection of infested pens and equipment's.

Lice

Haematopinus suis (hog louse) commonly infests pigs. It is a large louse (up to 5 mm), visible to the naked eye and is found mainly on the neck, folds of skin, and inside ears. Transmission is by direct pig to pig contact. Clinical signs in infested animals include Itching and rubbing, Hair loss, thickened skin, and small wounds. Anemia occurs in heavy infestations (especially piglets) and these louse act as vector for African swine fever and *Mycoplasma suis* (Eperythrozoonosis). Use pour-on or injectable medications, thorough cleaning and disinfection of pig houses, quarantine and treatment of new animals before introduction helps in control of lice infestation in pigs.

Flies

Flies such as *Musca domestica* (house fly) and *Stomoxys calcitrans* (stable fly) infest pigs. These flies cause Irritation, reduced feeding efficiency and can transmit diseases (e.g., *E. coli*, *Salmonella*). They are also nuisance to animals and workers. Control of flies can be done through proper sanitation and manure management, use of fly traps and insecticides and environmental control (reduce moisture and breeding sites).

Ticks

Common species of ticks infesting pigs include *Rhipicephalus*, *Amblyomma*, and *Boophilus* species (depending on region). Ticks are dangerous. Tick infestation in pigs lead to blood loss and anemia, skin irritation and secondary infections. Control can be done by use of acaricide sprays or dips, Maintaining clean and tick-free environment and control of tick infestations on other animals nearby.

Fleas

Common fleas infesting pigs include the *Ctenocephalides felis* (cat flea). Fleas cause irritation, scratching, and restlessness and cause anemia in piglets. Control can be effectively done by treating animals and bedding with insecticides, keeping pens clean and dry and by controlling fleas on other farm animals and pets.

Control of ectoparasites

Regular inspection of pigs and facilities, good hygiene and sanitation, quarantine and treat new stock, maintenance of dry, clean bedding and housing and implementation of a routine ectoparasite control program with veterinary guidance is important. Regular check-up of pigs for ectoparasites by a veterinarian and proper application of insecticides and acaricides for

specific ectoparasite problems under the guidance of veterinarian is highly essential.

Protozoan parasites affecting pigs

Eimeria* and *Isospora suis

Coccidiosis in pigs is caused by *Eimeria. Isospora suis* mainly in piglets of 1-3 weeks old. Clinical signs include diarrhea (often pasty or yellow), dehydration and poor growth. Control can be done by following strict hygiene in farrowing crates and use of anticoccidials.

Balantidium coli

It is another protozoon located in the large intestine of pigs. Clinical signs include mild to severe diarrhea. Control is by good sanitation measures.

Regular check-up of pigs for protozoan by a veterinarian and proper administration of antiprotozoal drugs for specific protozoan problems under the guidance of veterinarian is highly essential.

It is very important for pig farmers and entrepreneurs to have a sound knowledge about different endoparasites, ectoparasites and protozoan parasites that infect/infest pigs. This will help them to detect the health issues caused by parasites at an early stage and to take necessary control measures. Routine health check-ups of animals and inspection of farm premises by a qualified veterinarian should be carried out and proper medications as per the advice of the veterinarian should be given to the animals and managemental practices advocated should be followed to effectively prevent parasitic infections. Effective management of parasitic diseases in pigs will definitely help to improve the farm income and economy of the pig farm thereby leading to a great success in pig farming.