

Control and Management of Parasites in Backyard Poultry System: A Review

Pottabathula Malleesh*

Assistant Professor, Department of Veterinary Parasitology, College of Veterinary Science, Korutla, Jagtial District, PVNR Telangana Veterinary University, Hyderabad, Telangana.

*Corresponding author Email: malleeshparas@gmail.com

<https://doi.org/10.5281/zenodo.18437939>

Abstract

Backyard poultry farming plays a vital role in rural livelihoods, nutritional security, and women empowerment in many developing countries. However, productivity and health of backyard poultry are severely constrained by parasitic diseases. Both ectoparasites and endoparasites are widely prevalent under scavenging and semi-intensive systems due to poor biosecurity, lack of veterinary support, and continuous exposure to contaminated environments. Parasite infestations lead to reduced growth, poor egg production, anaemia, increased susceptibility to secondary infections, and mortality, resulting in substantial economic losses. This review summarizes the major parasitic problems of backyard poultry, their epidemiology, impact on health and production, and current control strategies with emphasis on sustainable, low-cost, and farmer-friendly approaches. Integrated parasite management, combining managemental, chemical, biological, and ethnoveterinary measures, is highlighted as the most practical strategy for effective control in backyard poultry systems.

Keywords: Backyard poultry, ectoparasites, endoparasites, parasite control, integrated management, rural poultry

Introduction

Backyard poultry farming is an integral component of smallholder and marginal farming systems across Asia, Africa, and Latin America and contributes substantially to household income, nutritional security, and women empowerment (Ahlers et al. 2009; FAO 2014). In India, backyard poultry plays a crucial role in livelihood support for rural and tribal populations through government-supported schemes such as Vanaraja, Gramapriya, and Srinidhi (Kumaresan et al. 2008). Birds reared under backyard systems are typically maintained under scavenging or semi-scavenging conditions with minimal inputs, making them highly vulnerable to parasitic infections.

Parasitic diseases are among the most common health problems affecting backyard poultry and are often neglected due to lack of awareness and limited access to veterinary services (Permin and Hansen 1998). Continuous exposure to infective stages in soil, litter, and intermediate hosts, coupled with poor housing and hygiene, favors the persistence and transmission of parasites (Sundaram et al. 2020). Effective control of parasites is therefore essential for improving productivity, welfare, and sustainability of backyard poultry production systems.

Major Parasites of Backyard Poultry

Parasitic infestations in backyard poultry can be broadly categorized into ectoparasites and endoparasites.

Ectoparasites

Ectoparasites live on the skin or feathers of birds and are responsible for irritation, blood loss, and reduced productivity. Common ectoparasites of backyard poultry include:

Lice

There are two kinds of lice: biting and bloodsucking. Blood-sucking lice attack only mammals, but biting lice infect both birds and mammals. Poultry lice are species-specific and cannot survive on humans. The chicken body louse (*Menacanthus stramineus*) and the shaft louse (*Menopon gallinae*) are the two species of lice most commonly found on poultry.

Mites

Chicken mites (*Dermanyssus gallinae*), also known roost mites or red mites, are found on domestic fowl around the world. Northern fowl mites (*Ornithonyssus sylviarum*) are the most common external parasite on poultry, especially on poultry in cool weather. Scaly-leg mites (*Cnemidoptes mutans*) are smaller than the northern fowl mite (1/100th of an inch) and live under the scales on birds' legs and feet. These mites are pale gray and have flat, circular bodies.

Fleas

Sticktight fleas (*Echidnophaga gallinacea*) attach themselves to the skin and wattles on the head of birds. Unlike northern fowl mites or scaly-leg mites, these fleas can thrive on other animals, including dogs, cats, horses, and humans.

Ticks

Fowl ticks (*Argas persicus*), also known as blue bugs, are considered soft ticks. The ticks that affect birds are light reddish brown to dark brown and their skin is wrinkled. Ticks live in the cracks and crevices of a poultry house.

Heavy ectoparasite infestation leads to restlessness, feather damage, anaemia, decreased egg production, and in severe cases, mortality. Some ectoparasites also act as vectors for bacterial and viral pathogens.

Endoparasites

Endoparasites reside within the gastrointestinal tract or other organs and are highly prevalent in free-range birds. Important endoparasites include:

Nematodes (Round worms)

- *Ascaridia galli* (Large Roundworm) is a very common intestinal parasite, especially in the small intestine, causing severe infections, poor growth, and decreased egg production.
- *Heterakis gallinarum* (Cecal Worm) is found in the ceca, it's a significant nematode, often co-occurring with tapeworms, and can lead to poor health.
- *Capillaria* spp: tiny, thread-like parasitic worms in poultry affecting the upper digestive tract (*C. contorta* and *C. annulata*) and lower digestive tract (*C. caudinflata* and *C. obsignata*).
- *Dispharynx spiralis* & *Tetrameres mohtedai*: These can embed in the proventriculus (glandular stomach), causing severe tissue damage, inflammation, necrosis, anemia, and weight loss.

Cestodes (Tapeworms)

Tapeworms attach to the small intestine, competing for nutrients and causing damage.

- *Davainea proglottina*: Highly pathogenic, can cause severe intestinal damage (enteritis, necrosis) and even death, especially in young birds.
- *Raillietina tetragona*: Common, causes nodules and damage, leading to weight loss.
- *Raillietina echinobothrida*: Causes nodules and inflammation in the intestine.
- *Raillietina cesticillus*: Often considered less harmful but still prevalent, anchoring to the intestinal wall.
- *Choanotaenia infundibulum*: Another common species,



requiring insects as intermediate hosts.

Trematodes

Echinostoma revolutum a common intestinal flukes (flatworms) that can infect backyard poultry, particularly those with access to environments containing their intermediate hosts: freshwater snails and, in some cases, fish or amphibians. Infections are a significant problem in free-range systems where birds forage near water bodies.

Protozoa

Coccidia (*Eimeria* spp.): Most common and damaging, causing bloody diarrhea and intestinal damage, highly species-specific to chickens or turkeys. Endoparasitic infections result in poor feed utilization, stunted growth, diarrhoea, reduced egg production, and increased mortality, especially in chicks and growers.

Epidemiology and Risk Factors

The prevalence and intensity of parasitic infections in backyard poultry are influenced by climate, management practices, housing, nutrition, and host immunity (Permin et al. 1999). Warm and humid climatic conditions prevalent in most parts of India favor the survival and development of parasite eggs, larvae, and intermediate hosts such as insects, earthworms, and snails (Soulsby 1982).

Indian studies have reported a high prevalence of gastrointestinal helminths ranging from 60–90% in backyard chickens, with *Ascaridia galli* and *Heterakis gallinarum* being the most dominant species (Sundaram et al. 2020; Yadav et al. 2019). Ectoparasites such as lice, mites, fleas, and ticks are frequently encountered throughout the year, with peak infestation during summer and monsoon seasons (Kumar et al. 2017).

Management-related risk factors include mixed-age rearing, poor sanitation, absence of regular deworming, and inadequate housing. Nutritional deficiencies and concurrent infections further increase susceptibility to parasitism in backyard poultry.

Impact of Parasitism on Backyard Poultry Production

Parasitic infestations significantly affect the health and productivity of backyard poultry. Chronic parasitism leads to subclinical losses that often go unnoticed by farmers but cumulatively result in substantial economic losses. Reduced growth rate, delayed sexual maturity, decreased egg production, poor egg quality, and increased susceptibility to other diseases are commonly observed.

In addition, some poultry parasites have zoonotic potential or act as reservoirs for pathogens of public health importance, emphasizing the need for effective control measures.

Strategies for Control of Parasites in Backyard Poultry

Effective parasite control in backyard poultry requires an integrated and sustainable approach tailored to low-input production systems (Permin and Hansen 1998).

Managemental and Hygienic Measures

Improvement of housing and sanitation is the cornerstone of parasite control. Regular cleaning of poultry sheds, removal of litter, proper disposal of droppings, and maintenance of dry surroundings reduce the build-up of infective stages (Soulsby 1982). Provision of elevated night shelters and avoidance of overcrowding help minimize contact with parasites. Dust bathing areas with sand, ash, or lime allow birds to naturally control ectoparasites.

Chemotherapeutic Control

Anthelmintics such as albendazole, fenbendazole, and levamisole are commonly used for controlling gastrointestinal nematodes in poultry (Permin et al. 1999). Strategic deworming at regular intervals, particularly before the onset of laying, is recommended. Ectoparasites can be controlled using approved insecticides and acaricides such as permethrin and deltamethrin, applied as sprays or dusts

(Kumar et al. 2017). Judicious use is essential to prevent drug resistance and residues.

Botanical and Ethnoveterinary

Approaches

Botanical products such as neem (*Azadirachta indica*), garlic (*Allium sativum*), tobacco, and turmeric are widely used in traditional poultry rearing practices and have shown antiparasitic activity (Ghosh et al. 2012). These plant-based remedies offer eco-friendly and affordable alternatives for backyard poultry systems.

Integrated Parasite Management

Integrated parasite management (IPM) combines improved management, targeted chemotherapy, botanical interventions, and farmer education to achieve sustainable parasite control (FAO 2014).

Challenges and Future Perspectives

Major challenges in controlling parasites in backyard poultry include lack of awareness, limited access to veterinary services, and economic constraints. Climate change and changing farming practices may further influence parasite epidemiology. Future research should focus on developing low-cost diagnostics, validating ethnoveterinary practices, and promoting community-based parasite control programs.

Conclusion

Parasitic diseases remain a major constraint to backyard poultry production, particularly in low-input rural systems. Sustainable control of parasites requires an integrated approach emphasizing improved management, judicious use of drugs, and adoption of botanical alternatives. Strengthening extension services, promoting awareness among backyard poultry farmers, and validating ethnoveterinary practices are essential for improving the health and productivity of backyard poultry and enhancing rural livelihoods.

References

Ahlers C, Alders R, Bagnol B, Cambaza AB, Harun M, Mgonezulu R, Pym

R (2009) Improving village chicken production: a manual for field workers and trainers. *ACIAR Monograph* 139:1–194.

FAO (2014) Family poultry development—Issues, opportunities and constraints. Animal Production and Health Working Paper No. 12. Food and Agriculture Organization of the United Nations, Rome.

Ghosh S, Nagar G, Kumar S, Sharma AK, Kumar B, Singhi PD (2012) In vitro efficacy of herbal acaricides against poultry ectoparasites. *J Parasit Dis* 36:123–127.

Kumaresan A, Bujarbaruah KM, Pathak KA, Chhetri B, Ahmed SK, Haunshi S (2008) Analysis of a village chicken production system and performance of improved dual purpose chickens under a subtropical hill agro-ecosystem in India. *Trop Anim Health Prod* 40:395–402.

Kumar S, Sharma AK, Ghosh S (2017) Control of poultry ectoparasites: current options and challenges. *J Parasit Dis* 41:1–10.

Permin A, Hansen JW (1998) Epidemiology, diagnosis and control of poultry parasites. FAO Animal Health Manual No. 4. FAO, Rome.

Permin A, Magwisha H, Kassuku AA, Nansen P, Bisgaard M, Frandsen F, Gibbons L (1999) A cross-sectional study of helminths in rural scavenging poultry in Tanzania. *Avian Pathol* 28:457–470.

Soulsby EJJ (1982) *Helminths, Arthropods and Protozoa of Domesticated Animals*. 7th edn. Baillière Tindall, London.

Sundaram M, Rao R, Latha BR, Balachandran C (2020) Prevalence of gastrointestinal parasites in backyard poultry in South India. *J Parasit Dis* 44:372–378.

Yadav N, Raja R, Mondal D, Kushwaha N (2019) Gastrointestinal parasitism in rural poultry and its control strategies. *Indian J Vet Sci Biotechnol* 15:45–50.