



Poultry Parasites: Northern Fowl Mites

Authored by Leonie Jacobs, Associate Professor, School of Animal Sciences, Virginia Tech

Northern fowl mites (*Ornithonyssus sylviarum*) are one of the more common ectoparasites, or external parasites, that can be present in a poultry flock. These mites live on their host throughout their life and feed on poultry blood. They are most commonly found around the vent, tail, and breast of the birds. Although these mites prefer poultry as a host, they will move onto humans and will bite if trapped (for instance, in tight clothing) (Wakenell 2016). Transmission can come from equipment, wild birds (sparrows and starlings), pet birds (passerines), and people. These mites can be a severe pest in poultry flocks.

Biology of the Northern Fowl Mite

Mites are gray/black, but after a blood meal, mites may appear red. Mites move slowly and cannot fly. Mites are between 0.5 millimeter and 1 millimeter in size (0.02-0.04 inches), thus visible to the naked eye as small specks. Mites spend their complete lifecycle (5-12 days; fig. 1) on their host but can live in the environment without a host for 2-3 weeks. Mites will infest (but not feed from) humans, so appropriate biosecurity measures — designated clothing and shoes — may reduce the risk of spread.

Northern fowl mite life stages

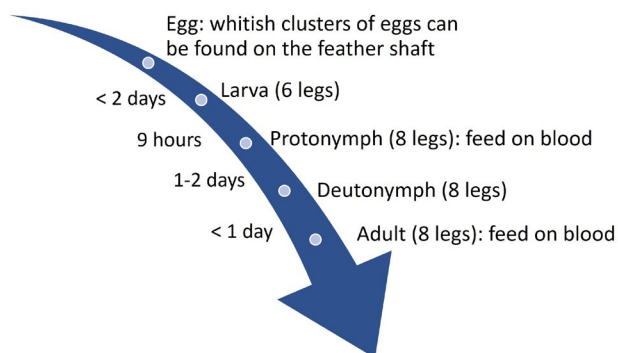


Figure 1. The five life stages of the northern fowl mite. These mites will spend their whole lifecycle on the poultry host. (Photo courtesy of Leonie Jacobs, Virginia Tech.)

An adult female will produce 1-3 eggs after a single feeding. An infestation can begin with a single adult female. The female can lay male, or unfertilized, eggs and will mate with the male offspring. The life cycle is short, which will result in a quick rise in mite numbers within a few weeks' time (Murillo and Mullens 2013).

Signs and Consequences of Infestation

Northern fowl mites are visible to the naked eye, but early infestations may be difficult to notice. Some signs of infestation are

- Black crusted skin and feathers.
- Thickening of skin and possible lesions and scabs.
- Agitated birds with frequent preening, especially when birds are perching/roosting.
- Blood spots or mites on chicken eggs.
- Pale comb.

Infestations will reach their peak after 4-5 weeks, and mites can then be easily spotted in feathers and on birds' skin (fig. 2). At peak infestation, a single bird may host over 100,000 mites. When infestations are severe, you may see blood stains and/or mites on the chickens' eggs. At infestations of over 50,000 mites per bird, birds can lose 6 percent of their blood daily. Consequences of infestation include the following (Murillo & Mullens, 2013; Kaufman et al 2000):

- Anemia and mortality.
- Inflammation and irritation at the site of the bite.
- Reduced egg production (-10% to -15%).
- Reduced egg size.
- Poor feed conversion (more feed needed for the same or worse production).



Figure 2. A heavy Northern fowl mite infestation with mites, eggs, and debris on the feathers and skin of a white hen. (Photo courtesy of Leonie Jacobs, Virginia Tech.)

Pest Management

Pest control should ideally involve the monitoring and management of ectoparasites and should include a rotation of approaches to keep the mites from developing resistance to a specific treatment.

Consult a pest control specialist or veterinarian when considering any chemical treatment as pest management, especially for off-label use of products. Sprays are less effective for birds housed on the floor (rather than in commercial cages). Treatments work most effectively when mite abundance is low: less than 50 mites per bird. Dusts have inhalation risks, and sulfur can be combustible in confined spaces. Do not use carbaryl powder either on the bird or on the premises (Wakenell 2016). Carbaryl is a possible carcinogen, and product residues can be detected in eggs 56 days after treatment at 0.5% and 1% doses (Ivey et al. 1984). Sulfur (>0.9% concentration) eliminated mite infestations for 4-8 weeks in caged laying hens (Mullens et al. 2012). Garlic spray (Birrenkott et al. 2000), kaolin (12%), diatomaceous earth (12%), and azadirachtin (at 0.06%) reduced but not eliminated mite infestations (Mullens et al. 2012).

Some chemical treatment options (retrieved from [PoultryDVM.com](https://www.poultrydvm.com)) are:

- Ivermectin.
- Spinosad.
- Fluralaner.
- Organophosphate.
- Pyrethrum.
- Permethrin.
- Methyl bromide.

Some nonchemical treatment options are:

- Sulfur.
- Azadirachtin (neem).
- Kaolin clay.
- Diatomaceous earth (DE).
- Garlic spray (10%).
- Heat (49 degrees C or 120 degrees F for 1 hour).
- Cold (-20 degrees C or -4 degrees F for 5 days).

Always read product labels carefully before applying any pesticide; mix and apply as directed. Do not overdose, do not treat too often, and follow all precautions exactly. Better yet, prevention is preferred over any treatment. The best way to prevent infestation is through biosecurity measures. Virginia Tech Extension offers a [video](https://www.youtube.com/watch?v=PMEIWUIC8hw) (<https://www.youtube.com/watch?v=PMEIWUIC8hw>) on biosecurity.

Key Take-Aways

- Northern fowl mites live on birds but can transfer to the environment or people.
- Infestations can reach huge numbers, with 100,000 mites per bird.
- Infestations can cause discomfort and distress in birds and can impact the bottom line (production).
- Early detection is key to manage infestations.
- Biosecurity measures are the best approach to **prevent** infestation.

Additional Resources

Jacobs, L., and M. E. Persia, 2021. "Maintaining the Health of Your Home Flock." <https://www.youtube.com/watch?v=PMEIWUIC8hw>.

Murillo, A. and B. Mullins. 2013. "Northern Fowl Mite (*Ornithonyssus sylviarum* [Canestrini and Fanzago]): Integrated Pest Management." <https://www.veterinaryentomology.org/northern-fowl-mite>.

Poultry Extension Collaborative. 2021. "Poultry Parasites: Bed Bugs." Poultry Extension Collaborative Newsletter. https://www.poultry-welfare-extension.com/uploads/2/5/6/3/25631086/pec_newsletter_vol_15.pdf.

References

- Birrenkott, G. P, G. E. Brockenfelt, J. A. Greer, and M. D. Owens. 2000. "Topical Application of Garlic Reduces Northern Fowl Mite Infestation in Laying Hens." *Poultry Science* 79 (11):1575-77.
- Ivey, M. C., G. W. Ivie, J. A. Devaney, and K. R. Beerwinkle. 1984. "Residues of Carbaryl and Two of its Metabolites in Eggs of Laying Hens Treated with Sevin® for Northern Fowl Mite Control by Dipping." *Poultry Science* 63:61-65.
- Kaufman, P., D. Rutz, and C. Pitts. 2000. Pest Management Recommendations for Poultry. New York State IPM Program, Cornell University Library eCommons. <https://hdl.handle.net/1813/42385>.
- Mullens, B. A. D. Soto, C. D. Martin, B. L. Callahan, and A. C. Gerry. 2012. "Northern Fowl Mite (*Ornithonyssus sylviarum*) Control Evaluations Using Liquid Formulations of Diatomaceous Earth, Kaolin, Sulfur, Azadirachtin, and *Beauveria bassiana* on Caged Laying Hens." *Journal of Applied Poultry Research* 21(1): 111-16. <https://doi.org/10.3382/japr.2011-0040>.
- Wakenell, P. 2016. "Management and Medicine of Backyard Poultry." In: *Current Therapy in Avian Medicine and Surgery*, edited by B. L. Speer, 550-65. Saint Louis, MO: Elsevier. <https://www.sciencedirect.com/science/article/pii/B9781455746712000240>.

Scan to access more publications about poultry.



<http://bit.ly/41AqRFT>

Visit our website: www.ext.vt.edu

Produced by Virginia Cooperative Extension, Virginia Tech, 2023

Virginia Cooperative Extension is a partnership of Virginia Tech, Virginia State University, the U.S. Department of Agriculture, and local governments. Its programs and employment are open to all, regardless of age, color, disability, gender, gender identity, gender expression, national origin, political affiliation, race, religion, sexual orientation, genetic information, military status, or any other basis protected by law.

VT/1023/APSC-190P