

Busting Myths

K-State veterinarian and expert on ticks shares common myths about the pests and provides advice for protecting yourself and your pets.

by **Katie Allen,**
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Awalk through the woods, a fishing trip or an evening playing in the yard with your children are situations with the potential to encounter dozens, even hundreds of blood-sucking pests known as ticks. Ticks can be a problem year-round, but they pose the most threat in warmer summer months. These disease carriers could be harmful to humans and pets alike.

Michael Dryden is a distinguished professor of diagnostic medicine and pathobiology at Kansas State University's (K-State's) College of Veterinary Medicine and one of the world's leading experts on ticks. When thinking about sheer tick numbers, he says, Kansas is considered "tick central," especially the eastern and southeastern regions. People should know and understand the common myths associated with ticks to protect themselves, their children and their pets.

Myth No. 1:

A tick is an insect.

A tick is not an insect, Dryden says, but rather, an arachnid.

"A spider is an arachnid, so a tick is closely related to a spider," he explains. "What's the difference? Basically, insect adults have six legs, and arachnids as adults have eight legs. They're both arthropods, but there's a difference."

Worldwide, there are 400-450 species of ticks, and about 90 of those species live in North America, Dryden says. Most ticks in Kansas and surrounding states are generalists, which means they aren't host-specific.

In eastern Kansas, the lone star tick is probably the most common species, he says,

and it's not host-specific. Many people recognize the females, because they have a white dot on their back. This is how the species got its name.

The lone star tick isn't as common west of Salina, Dryden says, because the tick needs adequate moisture and tree cover to survive.

Is it the spider-like resemblance that causes people to fear ticks, or is it more that people fear tick-transmitted diseases? Dryden says it's probably a little of both. He also researches fleas, another pest that people don't seem to worry about as much as ticks. The fear of ticks could come from an awareness of diseases ticks transmit.

"Fleas are bad," he says. "They're blood-sucking parasites as well. They certainly can cause a lot of damage and harm, and kill animals. But, a lot of people tend to put up with fleas to one extent or another. You get a few ticks on an animal, people seem to be more concerned."

Myth No. 2:

Ticks jump out of trees to land on their hosts.

Many people believe ticks jump out of trees and land on them, but it turns out they are physically unable to do that.

"I always say, 'Don't ruin a good story with the truth,' but they're not raining out of trees on us," Dryden says.

Ticks undergo questing — an ambush strategy — to find their next victim. When questing, they crawl up low shrubs, bushes or blades of grass, for example, anchor themselves with the hind legs, reach their front legs out in front of them and wave those legs in the air to detect a host.

"Those front legs contain Haller's organs, which are heat and carbon dioxide receptors," he says. "They wave them around in the air and try to detect an animal or human going by. As you brush up against them, they grab on."

"They can't leap. They can't jump. They have no physical mechanism to do that. There's no evidence that ticks climb way up into trees," he adds. "Some of these ticks, like the ones that transmit Lyme disease, have no photo receptors. They can't see. They live their entire life in the dark."

Most ticks like shaded areas, such as tree canopies, Dryden says. The lone star tick is one species that needs a deciduous forest canopy to survive hot summers and cold

winters. Tick numbers increase dramatically under the tree canopy. Also, large whitetail deer populations tend to drive high numbers of ticks to a specific area.

"The ticks get on you, and they often crawl up the back of your pants and shirts," he says. "The first piece of bare skin they hit is right on the back of the neck. We reach around, feel them and look up. The reaction and why we think they fall from trees is perfectly normal."

Myth No. 3:

Apply heat to a tick to get it to come out.

Applying heat to a tick to get it to release from the skin is a bad idea and could make the host more susceptible to getting a tick-transmitted disease, Dryden says. The first thing to do is pull it off. Using tweezers can help, but if none are available, people should grab the tick as close to the skin as possible and pull it straight off without twisting or irritating it.

"Most people don't understand that these ticks generally transmit the pathogens — the viruses, bacteria, protozoa — to us in their saliva," he explains. "If you irritate the tick with a match, Vaseline, whatever it may be, one of the first things the tick does when it's irritated is it salivates more. It starts regurgitating. If it hasn't passed a pathogen to you yet, now you've basically ensured that it's going to."

Generally, getting the ticks off within 24 to 48 hours dramatically reduces the risk of obtaining a tick-transmitted disease, Dryden says. Some diseases could be transmitted earlier than 24 hours under some circumstances, but the odds are in the host's favor if the tick comes off within a day.

Myth No. 4:

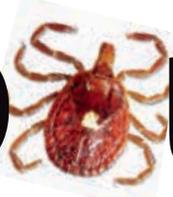
The tick's head must come out.

"It's really not a head per se," Dryden says. "It's the anterior end and just the mouthparts. There's no evidence that's a problem (if left in the skin)."

The worse thing that will happen if parts of the tick are left in this skin is the person or pet might have a small welt, almost like a chigger bite, he notes. A welt will likely show up even if the entire tick comes out, particularly with the lone star tick. The welt is just an inflammatory response from the tick's salivary proteins.



About Ticks



Myth No. 5:

All animal tick repellants work the same.

Ticks in numbers have the potential to get on animals and kill them from exsanguination, let alone all the diseases they might transmit to the animals, Dryden says. He's seen dogs with 500 to 1,000 ticks on them.

Dryden says people should talk to their veterinarian about what is the most effective tick product for their particular pet. Not every product works the same everywhere, because different ticks respond differently to different compounds.

Also, new products are always coming down the pipeline to keep ticks away from pets, and veterinarians will hopefully be up-to-date on what's happening with new products and can tell pet owners about them, he says.

"Some of these new products are prescription-only, so you can only get them from your vet," Dryden says. "You need to make sure your animals will tolerate these products well."

Dryden says he believes dogs and cats in Kansas should be on a product year-round and never taken off, as ticks can be a problem throughout the year.

"This last winter was hard, and we didn't start seeing ticks until March," he says, "but in years past we've seen ticks in January."

Myth No. 6:

Applying repellants and spraying the yard won't do any good.

Dryden says due to the length and below-average temperatures of last winter, ticks don't seem to present as much of a problem this summer compared to recent years.

"A long winter tends to slow tick numbers," he explains. "That's going to

Tick diseases in Kansas

Of all the tick-transmitted diseases, four cause the most concern in Kansas, according to Charles Hunt, state epidemiologist for the Kansas Department of Health and Environment.

1. Ehrlichiosis/anaplasmosis: Kansas showed 96 reported cases in 2013 and 49 cases in 2012.
2. Lyme disease: Kansas showed 34 reported cases in 2013 and 19 cases in 2012.
3. Rocky Mountain spotted fever: Kansas showed 166 reported cases in 2013 and 141 in 2012.
4. Tularemia: Kansas showed 28 reported cases in 2013 and 22 in 2012.

Last year was a bad year for tick diseases, Hunt says. Most cases are reported in warmer summer months.

As of Aug. 16, 2014, (www.kdheks.gov/epi/download/All_Disease_Counts_Summary_2014.pdf), the numbers of tick-transmitted disease cases this year in Kansas include 39 cases of ehrlichiosis/anaplasmosis, 10 cases of Lyme disease, 72 cases of Rocky Mountain spotted fever and two cases of tularemia.

"With warmer weather, there is a likelihood of these tick-borne illnesses becoming more prevalent, and people need to take appropriate precautions when they're going to be out in wooded areas or other places where ticks can be present," he cautions.

Hunt says he encourages people who become ill and know they've been bitten by a tick to seek medical help immediately. Common tick-transmitted diseases are treatable with antibiotics, and the sooner the diagnosis, the less likely there will be medical complications.

Different symptoms accompany the different tick-transmitted diseases, he says, but many include body aches and a fever. People who have Lyme disease or Rocky Mountain spotted fever usually develop a rash.

More information about tick-transmitted diseases and how to report them is available on the Centers for Disease Control and Prevention website (www.cdc.gov/ticks/diseases) and Kansas Department of Health and Environment website (www.kdheks.gov/epi).

Editor's Note: See also Troy Smith's article "Q Fever" on page 90 of the May 2012 Angus Journal for information on another tick-borne illness.

change year-to-year, but there's been a general upward trend for the last 25 years. They seem to be getting worse over time — in numbers, densities and diseases."

Dryden adds that even if tick numbers are low overall, certain areas could see staggering numbers of the pests. Local climatic conditions including temperature, humidity and snow cover, as examples, can affect seasonal, even month-to-month tick populations. People should take precautions

to limit their exposure to ticks.

"For human protection, there are a few things we can do," Dryden says. "There are some common insect repellants out there. I'm a fan of DEET. It's an effective repellant and does a good job protecting us from ticks, but nothing is perfect."

He says don't put too much repellant on the skin of children and it might be better to put it on their clothes. An alternative to

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Digital extras

In a two-part video series provided by K-State Research and Extension, radio host Richard Baker speaks with guests Michael Dryden and Charles Hunt. Dryden is one of the world's foremost experts on ticks and a distinguished professor of diagnostic medicine and pathobiology in the College of Veterinary Medicine at Kansas State University. Hunt is a state epidemiologist with the Kansas Department of Health.



Part 1 — https://www.youtube.com/watch?v=7CetcyL9_c&list=UU-x476YpaRWxpPldYVDkZQ



Part 2 — <https://www.youtube.com/watch?v=1UpB67CgUhQ&list=UU-x476YpaRWxpPldYVDkZQ>

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repellent is to impregnate clothing with a compound called permethrin, which can be found at many sporting-goods stores. People shouldn't get permethrin on their skin and need to let their clothes dry before wearing.

In using both repellent and permethrin, it's important to follow the label directions, Dryden warns.

For yards, using a spray that contains a compound called cyfluthrin can be effective for tick control.

"You're generally going to spray under the

shrubs, bushes and around the edge of your property," Dryden says. "It's critical of any insecticide to always follow the label recommendations provided by the EPA (Environmental Protection Agency) and the manufacturer of that product. Spray the product, and let it dry before you let the pets and kids have access to that area."

An alternative to personally spraying the yard is to hire a professional exterminator, he says.

More information

For more information about ticks in Kansas and tick-transmitted diseases, visit Dryden's website at www.drmichaeldryden.com, the Kansas Department of Health and Environment website at www.kdheks.gov/epi, or read more in this K-State Research and Extension publication: www.ksre.ksu.edu/bookstore/pubs/mf2653.pdf.



Blacklegged ticks now established in Ohio

They were almost absent from Ohio until 2009. Since then, the number of blacklegged ticks found in Ohio has grown significantly. The bad news: Blacklegged ticks carry Lyme disease.

A new study conducted by Ohio State University (OSU) and the Ohio Department of Health has found that blacklegged ticks and Lyme disease are now an emerging public health concern in Ohio, as tick populations carrying the disease have become established, particularly in the eastern half of the state.

"Ohio had a low incidence of human Lyme disease, which is largely attributed to the absence of the transmitting vector, the blacklegged deer tick, in the state," says Glen Needham, professor emeritus of entomology in the university's College of Food, Agricultural, and Environmental Sciences (CFAES) and one of the study's authors. "However, evidence presented in this study suggests that the blacklegged deer tick is becoming established in certain areas of Ohio."

The open-access paper was published June 2014 in the journal *Frontiers in Cellular and Infection Microbiology*.

Ticks are small arachnids that hang out along woodland edges, in woods, tall grass, weeds and underbrush. Like mosquitoes, ticks feed on the blood of birds, reptiles and mammals, including humans and pets. In doing so, ticks can transmit a variety of diseases, such as Rocky Mountain spotted fever and Lyme disease.

Lyme disease causes flu-like symptoms such as fatigue, fever, headache, and muscle and joint aches. It often produces a distinctive large, circular red rash that looks like a bull's-eye. When caught early, the disease can be successfully treated with antibiotics. Though not known to be fatal, the disease can progress to chronic arthritis, neurological symptoms and cardiac problems if left untreated.

Lyme disease is caused by an agent known as *Borrelia burgdorferi*, which is found primarily in the white-footed mouse. Blacklegged ticks (*Ixodes scapularis*) pick up the disease-causing agent from the mice and serve as vectors, or carriers, of Lyme disease.

Most people who get Lyme disease, Needham says, will acquire it from the nymphal, or juvenile, stage of the tick, which is very small — the size of a poppy seed — and is active in spring and summer, particularly in wooded areas. Hunters and meat processors will especially be at risk from adult ticks this fall from September through December.

For the study, Needham and colleagues analyzed data from the state health department's tick surveillance program; Ohio's multi-agency surveillance of deer heads for chronic wasting disease; and the results of their 2010 studies of ticks and *B. burgdorferi* prevalence in rural Tiverton Township, Coshocton County, where established populations of blacklegged deer ticks carrying the Lyme disease agent have been identified.

The first blacklegged deer tick confirmed in Ohio was found

in 1989. The number of these ticks found annually remained low from 1989 until 2008 and accounted for less than 1% of all ticks collected by the state health department's tick surveillance program.

However, things began to change dramatically in 2009, when 15 blacklegged deer ticks were collected, followed by 40 in 2010, 184 in 2011 and 182 in 2012. By 2012, these ticks accounted for almost 25% of those received by the state health department. A higher number of ticks was also found on deer heads. For example, in 2011, 1,830 ticks were collected from 96 of 560 deer heads examined. The previous year yielded only 29 ticks from around 200 deer inspected.

Such an increase in the number of blacklegged deer ticks found throughout the state mirrored the confirmed and probable cases of Lyme disease reported to the health department: 43 cases in 2010, 50 in 2011, 67 in 2012 and 93 in 2013.

"Blacklegged deer ticks have now been found in 57 Ohio counties and are likely established in 26 of those counties, mostly east of I-71 where we have deciduous forest," says Needham, who is now studying tick-borne diseases for the U.S. Air Force at Wright-Patterson Air Force Base in Dayton.

In the United States, Lyme disease is endemic (meaning it has become highly prevalent) in two different regions: the Northeastern states and the Upper Midwestern states. Ohio lies between these two areas, which puts the state in the crosshairs of expansion of the disease.

"Given the proximity of Ohio counties with established blacklegged tick populations to highly endemic Pennsylvania, it is possible that the emergence of this tick vector simply reflects the continuing expansion of the Northeast Lyme disease-endemic region in the U.S.," Needham says.

"Migrating birds, deer and human activity are likely spreading the tick and the disease agent. Moving tick-infested harvested deer to non-infested areas of the state may play a role, too, so deer should be examined before moving them. If infested, then take care in processing the animal, and the hide needs to be buried or burned, or salted down if destined for tanning."

Because of these factors, Needham says he expects that the number of blacklegged ticks and the percentage of them infected with *B. burgdorferi* will continue to increase in Ohio.

"It is important that the public and health professionals become aware of the increased risk for contracting Lyme disease in Ohio, and that preventive measures are taken to limit exposure to ticks when going outdoors," he says.

Information about ticks and Lyme disease, including tips for prevention, is available at www.cdc.gov/lyme/; www.odh.ohio.gov/ticks; <http://wildlife.ohiodnr.gov/species-and-habitats/ticks-in-ohio>; and <http://tickencounter.org>.

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