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From: lissa [lissa@lissa.net]
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To: 'EXMAGDRL'
Subject: DOE Topic #17: Ticks

Hi All,

In March I changed jobs and am now working for USDA/Animal and Plant Health Inspection Services (APHIS). Because we're involved in protecting America from animal and plant hazards, and because a large contingent of our staff are veterinarians, we often receive bulletins of interest to dog owners. The bulletin below is not for the squeamish (sorry, ticks give me the creeps!) but it may help protect you and your pets from tick-borne diseases.

With permission from APHIS to share, this is Dog Owner Education Topic #17. Thanks for educating yourselves to benefit dogs and their people!

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"A dog is the only thing on earth that loves you more than he loves himself." - Josh Billings

Ticks

Ticks are members of the arthropod class Arachnida, making them relatives of mites, spiders, and scorpions. There are three families of ticks, two of which are known to transmit disease to humans. The family Ixodidae includes 12 genera, of which *Amblyomma, Dermacentor,* and *Ixodes* transmit disease to humans in the United States. The family Argasidae contains four genera; only *Ornithodoros* is known to commonly transmit disease to humans in the United States.

Tick-borne diseases are the most common vector-borne illnesses in the United States. Lyme disease is the most common, but several others also occur. The ehrlichioses have only been identified as agents of human disease in the United States in the past few decades, and knowledge about them is still evolving. Rocky Mountain spotted fever is relatively common and can be severe, especially in children. Tularemia has long been known as a human disease, but there is renewed interest because of its potential use in biological warfare. Other less common diseases that can be carried by ticks include: babesiosis, southern tick-associated rash illness, tick-borne relapsing fever, anaplasmosis, Colorado tick fever, and Powassan encephalitis. All of these diseases can be severe or even fatal. Most of them are easily treatable when identified early; however, most of these diseases present initially with nonspecific symptoms and are often difficult to recognize.

The mechanism of transmission of disease through tick bites is not well understood. After a blood meal on an infected host, pathogens harbored in the tick gut may migrate to their salivary glands and then are transmitted to a new host during a subsequent meal. When a tick attaches to a human, there are chemicals produced by the tick which affect the human immune response and the blood flow around the bite area. These factors combine to enhance the blood meal of the tick and facilitate transmission of infectious agents to the host.

Ticks go through several stages in their life cycle: egg, larva, nymph, and adult. For all tick species, the larva is very tiny (a mere speck), the nymph is a little larger (but still very small, about the size of a

pin head), and the adults are larger and easy to see. Larval ticks rarely transmit pathogens to humans, but both nymphs and adults may do so. Nymphs are of greatest concern, because their small size makes them easy to overlook. A tick needs a blood meal from a host (mammal, bird, reptile, or human) in order to molt (progress to the next stage of its life cycle), or to reproduce as an adult. Humans are essentially accidental hosts that are not a critical part of any tick's natural life cycle. While feeding on a host, a tick becomes engorged with blood, and then usually drops off when finished. Once in a protected place, immature ticks molt to the next stage. Adult females produce eggs after their blood meal and mating.

Ticks generally live in shady, moist ground litter, but most must climb weeds, tall grasses, bushes, brush, or trees in order to find suitable host animals. They also may be found in lawns and gardens, on the edges of woodlands, and around stone walls where small rodents thrive. Ticks cannot jump or fly and generally do not drop from trees onto hosts; they are acquired through direct contact. When a tick finds a host, it will crawl to a protected area, often the groin, armpit, scalp, ears, back of knees, navel, or neck. Ticks generally wander for several hours before beginning to feed by inserting their mouthparts into the host's skin. It is known that a tick needs to be attached for at least 24–36 hours in order to transmit the disease organism of Lyme disease to its host; a tick needs to be attached for 4–6 hours in order to transmit Rocky Mountain spotted fever bacteria to its host. If a tick is not detected, it will feed for several days before usually dropping off the host. Only a relatively small percentage (4–10%) of any given tick population are actual carriers of a disease organism.

Fortunately, there are some simple steps you can take to protect yourself and your family from tick bites and tick-borne diseases.

- Always be alert for ticks during the spring and summer months (April through September) when they are most active.
- When possible, avoid tick habitats such as tall grass, leaf litter, bushes, and woods. Many local health departments, parks, and cooperative extension services have information about the areas most infested with ticks.
- Walk in the center of trails and avoid brushing against weeds and tall grasses.
- When working outdoors or in these areas, cover as much skin as possible. Wear long sleeve shirts tucked into pants, and long pants tucked into socks. Wear light-colored clothing with a tight weave to spot ticks more easily. Some ticks can crawl down into shoes and are small enough to crawl through most socks
- When pruning bushes, weeding, or otherwise handling vegetation, wear light-colored gloves and check them often for ticks.
- Wear close-toed shoes or boots.
- Keep long hair pulled back.
- Avoid sitting directly on the ground or on open stone walls.
- Use a chemical repellent with DEET or Permethrin and wear protective clothing. Repellents containing Permethrin can be sprayed on boots and clothing. When used in this manner, the repellent will be protective for several days. Repellents containing DEET can be applied to the skin, but they protect for only a few hours before reapplication is necessary. **Be sure to follow label directions for applying chemical repellents.**
- Spot check yourself and others frequently. Check these areas in particular: under the arms, in and around the ears, inside the navel, back of the knees, in and around the hair, between the legs, and around the waist.
- Do not forget to check your pets. If one tick is found, check thoroughly, there may be others.
- After working outdoors, wash and dry clothing as soon as possible to eliminate unseen ticks. Placing your clothes in a hot dryer for 20–30 minutes will ensure that any ticks you fail to notice will be killed.
- Keep lawns mowed and underbrush cut and thinned.

- Clear brush and leaf litter around houses, stone walls, and at the edge of gardens.
- Laying down wood chips or gravel where lawns butt up against wooded areas can reduce the number of ticks on grassy areas by creating a drying barrier between the more heavily tick-infested vegetation areas and the grass.
- Stack woodpiles in an open, dry location preferably off the ground.
- Use a chemical control agent. Effective tick control chemicals are available for use by the homeowner, or they can be applied by a professional pest control expert. **Follow label directions for safe use of chemical control agents.**
- Use bait boxes to treat rodents. "Bait boxes" that treat wild rodents with acaricides (pesticides that kill ticks) are now available for home use. Properly used, these boxes have been shown to reduce deer ticks around homes by more than 50%. The treatment is similar to products used to control ticks and fleas on pets and does not harm the rodents.

If you find a tick on your body, remove it as soon as possible. The best way to remove a tick is with a pair of fine-point tweezers. Grasp the tick by the head or mouthparts exactly where they enter the skin. Without jerking or twisting, pull firmly and steadily directly outward. If mouthparts remain embedded in the skin, they are comparable to having a splinter in your skin. Mouthparts alone cannot transmit disease because the infective body of the tick is no longer attached. However, to prevent the chance of secondary infection, it is best to remove them. Seek medical assistance if necessary. Tick removal will take time, so be **patient**. Avoid touching the tick with bare fingers–use a tissue or glove to prevent disease transfer. **Do not** squeeze the tick's body or use Vaseline, a hot match, alcohol, or any other irritant in an attempt to kill or remove the tick. These methods will actually cause the tick to regurgitate, increasing the risk of infection from any pathogen located in the saliva or midgut.

Once the tick has been removed, place it in a vial or jar of rubbing alcohol to kill it. Label the container with the date, body location where the tick was attached, and location where it may have been picked up. This information may be helpful to a doctor if signs of disease occur. Clean the bite wound with soap and water and apply an antiseptic such as rubbing alcohol or iodine. Watch for signs of illness such as rash or fever, and see a health care provider if these develop. Discard the preserved tick after one month; all known tick-borne diseases will generally display symptoms within this time period.