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Dog Tips

They Built a Better Mousetrap — One That Reduces Ticks

Ticks are rampant, and can spread multiple diseases with a single bite. Now there's a new trap that purged the number of ticks in one neighborhood by 88% and 97% in one and two years respectively. Plus, this odd animal does essentially the same, though you probably shun it.

Analysis by Dr. Karen Shaw Becker

STORY AT-A-GLANCE

- Mice and other small mammals are one of the primary transmitters of diseases like Lyme disease to ticks
- Researchers are now testing a new method to control the spread of tick-borne disease, which involves targeting the mice that the ticks like to feed on
- The Select Tick Control System (TCS) is a small box that acts like a baited mousetrap, helping to lure mice and other small creatures, like chipmunks, inside; as the animals enter, they come in contact with a cloth that's soaked in insecticides similar to those found in anti-tick medications often given to household pets
- TCS boxes resulted in an 88% and 97% reduction in nymphs (young ticks) after year one and two of treatment, respectively, when used in a residential neighborhood
- While the use of tick boxes may be the lesser of two evils compared to spraying insecticides, the fact remains that no one knows what unintended repercussions the boxes could have on wildlife in the present or future

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Ticks are widespread throughout the U.S., and they pose a significant threat to both pets and people. From Lyme disease and Rocky Mountain spotted fever, ticks can transmit multiple diseases with a single bite, and often go unnoticed because their saliva contains anesthetics so you or your pet can't feel the bite (or the continued feeding). Ticks pick up diseases when they feed on host animals, and deer are often blamed as the primary disease carriers that contribute to the spread of disease via ticks.

However, other smaller animals, like mice, may actually be more problematic. For instance, in the case of Lyme disease bacteria, white-footed mice infect 75% to 95% of larval ticks that feed on them.[1] Such pathogens within the tick may then be transmitted to the host via saliva released during the feeding process.[2] Researchers are now testing a new method to control the spread of tick-borne disease, which involves targeting the mice that the ticks like to feed on.

Insecticide-Laced 'Tick Boxes' Help Control Tick Populations

The Select Tick Control System (TCS) is a small box that acts like a baited mousetrap, helping to lure mice and other small creatures, like chipmunks, inside. As the animals enter, they come in contact with a cloth that's soaked in insecticides similar to those found in anti-tick medications often given to household pets. Available commercially to pest control professionals, the boxes are currently registered to be sold in 26 states.

The idea is that the mice become far less likely to become a favorable host to ticks once they enter, and leave, the boxes, and any ticks that attempt to feed on the treated mice end up dying.

In a two-year study that attempted to evaluate the effectiveness of the TCS boxes when used in a residential neighborhood, they resulted in an 88% and 97% reduction in nymphs (young ticks) after year one and two of treatment, respectively.[3] The tick boxes are intended to have fewer environmental consequences than widespread use of pesticides in the environment, however there were some downsides reported.

First, the boxes only target specific life stages within the tick's two-year life cycle and kill only ticks that have already acquired a host. This means that significant reductions in ticks may not be seen for months or years after deployment. "Such lag-times may affect their widespread public acceptance and commercial use that requires that significant tick control must be achieved more rapidly," the researchers noted.[4]

Ecologist Felicia Keesing, Ph.D. also questioned the study's results, as it tested boxes in residential backyards but used a wildlife area as a control, rather than using a similar location.[5] Keesing is involved with The Tick Project, a five-year study that's comparing the use of TCS versus a chemical spray to control ticks in 24 Dutchess County, New York neighborhoods.[6]

"The study will answer once and for all whether we can prevent cases of tick-borne disease by treating the areas around people's homes. If this approach prevents disease, we will be able to recommend plans that could be immediately adopted by local municipalities, governments, community groups, or neighborhoods," according to The Tick Project.

Could the Use of Tick Boxes Harm Wildlife?

While the use of tick boxes may be the lesser of two evils compared to spraying insecticides, the fact remains that no one knows what unintended repercussions the boxes could have on wildlife in the present or future. The active ingredient in the boxes is fipronil, an adult flea insecticide that works by disrupting the central nervous system of insects.

Fipronil is widely used in pet flea and tick products, cockroach and ant baits, agricultural products and chemicals used to treat turf and golf courses. It's classified as a possible human carcinogen by the U.S. Environmental Protection Agency (EPA), and long-term exposure to the chemical has been linked to seizures, decreases in thyroid hormone levels, reduced fertility, delayed development and death in animal studies.

In addition, the National Pesticide Information Center notes that fipronil was found to be highly toxic to sea and freshwater fish, certain birds and honeybees.[7] There is concern, too, about what effects the insecticide could have on animals higher up in the food chain, that feed on the treated mice. However, the Tick Project stated:[8]

> *"The concentration of fipronil in the bait boxes is 10 times lower than that found in topical flea and tick control products (Frontline ®) used on household pets. The likelihood of coming into direct contact with the wick containing this low concentration of fipronil is low, because it is encased in a child-resistant box.*
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> *The chemical is also safe for predators. A predator would have to consume ~600,000 mice that had been treated with fipronil to experience even a mild effect from the chemical."*

Are There Natural Ways to Control Ticks?

There's no doubt that ticks pose a threat to pets and people. In 2016 alone, the U.S. Centers for Disease Control and Prevention (CDC) received reports of more than 96,000 diseases caused by bites from ticks, fleas and mosquitoes, up from just over 27,000 in 2004.[9] Nature does have a way of controlling these pests naturally, however, in the form of opossums.

Research conducted by Rick Ostfeld, Ph.D., a senior scientist at the Cary Institute of Ecosystem Studies, and colleagues revealed that more than 96% of tick that attempt to feed on opossums do not survive, as the animals consume them during grooming.[10] Opossums act as "ecological traps" for larval ticks, hosting perhaps more than 5,500 in a season and consuming the majority of them before they reach maturity, he said.

Keesing suggested in an interview with VPR (Vermont's NPR news source) that opossums may be more sensitive to the feeling of ticks on their bodies, allowing them to notice when they attach and easily pinpoint their locations for quick removal.[11] What else is interesting, Keesing noted, is that of the ticks that do successfully feed on opossums, very few of them pick up the bacteria that cause Lyme disease, which means they're less risky to humans and pets, too.

So, one way to reduce ticks in your backyard is to make friends with opossums, and if you notice one living there, don't attempt to kill it or relocate it. You'll also want to closely monitor your pets for ticks on a daily basis, including between their toes, under their earflaps and in skin crevices.

If you know you'll be taking a walk in a high-risk area for ticks, use a natural tick deterrent to make your pet a less appealing host, and be sure your pet has a strong immune system, which can be achieved by feeding a nutritionally balanced, fresh food diet and giving your pet opportunities for regular exercise.

If you do find a tick, remove it immediately using tweezers or a tick-removing tool, then disinfect your dog's skin with soapy water or diluted povidone iodine (Betadine) and apply a drop of lavender oil to the area. Most tick bites are harmless, but if you know your dog has been bitten by a tick, ask your vet for the SNAP 4Dx or Accuplex4 test, which are screening blood tests for tick-borne diseases.

The tests can be administered three to four weeks after the tick is removed. If you don't have one of these tests done, you'll need to watch your dog closely for several months for any signs of loss of appetite, lethargy, change in gait, fever or intermittent limping — all the symptoms of potential tick-borne disease, and once pets exhibit symptoms the disease is much harder to treat.

If you live in a tick-prone area, you may want to have your dog checked for silent tick-borne infections every six months as a precautionary move, as it's far easier to treat these illnesses before symptoms appear.

Sources and References

[1] QZ.com July 9, 2015

[2] U.S. CDC, Life cycle of hard ticks that spread disease

[3,4] Journal of Medical Entomology, Volume 54, Issue 4, 1 July 2017, Pages 1019–1024

[5] CNBC March 27, 2017

[6] The Tick Project, Overview

[7] National Pesticide Information Center, Fipronil

[8] The Tick Project, FAQs

[9] Reuters May 1, 2018

[10] Proc Biol Sci. 2009 Nov 22; 276(1675): 3911–3919

[11] VPR June 6, 2017