What are we Going to Do About All These Ticks?
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While recent pharmaceutical advances have been made in the control of flea reproduction, such advances in the area of tick control are lacking. With the exception of the brown dog tick *Rhipicephalus sanguineus*, our ability to manage tick reproduction is limited, if not almost non-existent. As discussed previously in most flea infestations we have the opportunity to control flea reproduction by either killing fleas before they can reproduce or killing flea eggs. However, it is not just because we have effective residual insecticides, insect growth regulators or insect development inhibitors that we are successful, it is also due in large part to the fact we can often target the primary reproductive host, the flea infested dog or cat. And interestingly, failures in flea control often occur when flea infested feral pets or flea infested urban wildlife invade the owners’ yards.

But when dealing with most 3-host ticks the problem is that the majority of the reproducing ticks are not on the dogs or cats, but on their native wildlife hosts. Since we are limited in our ability to manage ticks on wildlife, reinfestations are a common occurrence and protracted use of acaracides is routine in many areas. As mentioned earlier one tick species that is an exception is *R. sanguineus*. While this tick is a 3-host tick, practically it can be said to function as a 1-host tick, since all life stages prefer to feed upon dogs. Therefore, we have the opportunity through rigorous application of acaracides to kill female ticks before they reach repletion.

Since tick control can be extremely difficult and because they are vectors of a variety of bacterial and protozoal diseases, veterinarians should have an understanding of the ecology of the tick(s) encountered in the area in which they practice. Veterinarians need to be educated on the various aspects of tick ecology, disease transmission and control methodologies so that they can then educate their staff and pet owners.

Numerous studies demonstrate the high level of efficacy of the various acaracides but the residual activity is rarely 100% and the efficacy of products varies between and as well as within species, even in the same laboratory. Evaluations of acaracides under natural or field conditions further illustrates that while efficacy is good it is not 100%.

In a field efficacy trial conducted in Kansas U.S.A, an imidacloprid (8.8% w/w)-permethrin (44.0% w/w) formulation was evaluated on dogs against naturally occurring populations of *Amblyomma americanum*. When dogs were walked in a naturally tick infested environment the 48-hour post-exposure efficacy of imidacloprid-permethrin formulation was 93.5%, 98.9%, 94.6%, 94.1% and 96.6% on days 3, 7, 14, 21 and 28 respectively, post-treatment.5

Variation in product efficacy occurs. In two studies conducted at K-State, different results were found when evaluating the efficacy of acaracides against *Dermacentor variabilis* infestations in dogs from two different regions of the USA. In the first study, the efficacy of imidacloprid–permethrin and fipronil–(s)-methoprene formulations were evaluated against a D. variabilis isolate from California. The 48-h post-infestation efficacy on day 30 post-treatment was 92.0% and 83.2%, respectively, for the imidacloprid–permethrin and fipronil–(s)-methoprene formulations. In the second study, the 48-h post-infestation efficacy on day 30 for the imidacloprid–permethrin and fipronil–(s)-methoprene formulations against a D. variabilis isolate from Oklahoma was 17.5% and 75.7% respectively. New isoxazoline molecules (afloxaner and fluralaner) are now offering the first ever oral approach to tick control. These compounds have demonstrated excellent efficacy against a variety of tick species.

While product efficacy is often excellent in most studies, significant variation in efficacy can occur and 100% control is rarely achieved. Therefore it can be expected that under natural conditions in areas where dogs are being frequently exposed to ticks pet owners will see ticks on treated dogs. We might also expect that efficacy in real world situations might be lower due to such factors as bathing and swimming, differences between dog breeds and haircoat types and frequency and correctness of product application.

Since 100% tick kill is not always achievable, perceived efficacy of acaracides may be directly related to the numbers of ticks to which dogs are exposed. If a dog is treated with one of these highly efficacious acaracides and encounters just a few ticks it is likely all those ticks will be killed. However, if tick exposure is considerably larger, we can expect a few ticks to be observed on these dogs and pet owners may perceive a lack of efficacy. Therefore in areas where tick populations are increasing the perception may be that the products are not as effective as they once were.

Pet owners often view tick infestations of their pets differently than flea infestations. Whether this is due to concerns about tick transmitted diseases or simply a phobia, the presence of a couple of ticks on the pet often elicits a more pronounced negative reaction than the presence of a couple of fleas. A 95% effective flea product may provide great client satisfaction while a similarly effective tick product may be perceived as a failure. Therefore it is not uncommon that label recommended application of a product does not appear to control the problem. This may be real or perceived, based upon pet owner expectations of product performance. Given pet owner concerns, the fact that ticks transmit serious diseases and lack of 100% efficacy; occasionally additional control measures are needed. If additional control measures are deemed necessary, pet owners need to be educated as to why additional control measures are necessary and notations made in the pet’s record.
One of the most common practical attempted solutions to this problem in dogs is to increase the frequency of application. Here increased residual efficacy is the expected outcome, since you are increasing the residual acaracide levels with the shorter application intervals. EPA registered acaracides should be used according to their product labels. Additionally, with many 3-host ticks, destruction of tick habitat can reduce exposure pressure. Areas that serve as refuge for ticks and wild mammals such as grass, weeds, and brush piles, between runs and along buildings, can be eliminated or treated with an approved acaracide.

In some situations, especially in tropical and subtropical regions and in climate controlled kennels brown dog ticks may infest buildings with ticks crawling up walls, curtains and throughout the home or kennel. In these situations acaracides may need to be sprayed indoors into cracks and crevices, behind and under furniture or cages and along walls and the ceiling. Following application, make sure the acaracide is dry before you allow animals or humans back into the premises to minimize toxicity problems. Finally, restricting pet access from tick-infested environments may be necessary.

It is apparent that the range and local density of certain tick species has increased in many areas. Whatever the factors it must be recognized that tick infestation pressure may be much higher and associated tick transmitted diseases may be more prevalent in some locations today than in the past. The increase in tick populations means that pets are encountering ticks more frequently, are exposed to more ticks per encounter and clients may be seeing more ticks on their pets than in the past. Since tick products do not kill or repel all ticks instantly, clients may get the false impression that the products are not performing as well as in the past. These situations necessitate that veterinarians set client expectations, before clients set their own unrealistic expectations of control.

References

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