



NEW OPTIONS IN ECTOPARASITE CONTROL

A GLOBAL ROUNDTABLE DISCUSSION

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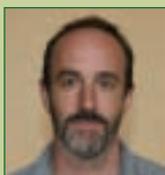
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DESPITE AN ARRAY OF PRODUCT CHOICES, fleas, ticks, and other ectoparasites remain a persistent problem for pets and their owners around the world. Recently, a group of experts selected by Fort Dodge gathered in Miami, Florida, to discuss the current state of ectoparasite control, new options for managing associated diseases, and strategies that can be employed to keep animals as healthy as possible.

DERMATOLOGY

Karola Swan: Our first topic of discussion today is dermatology, and we'll begin with flea allergy dermatitis (FAD). Please tell us how important FAD is in the area where you live and work.

PREVALENCE OF FLEA ALLERGY DERMATITIS

Patrick Bourdeau: In France, we have data from 1992 to the present showing severe FAD—or flea bite hypersensitivity—makes up 14 percent to 20 percent of total dermatologic cases. Overall, fleas affect 30 percent to 40 percent of the canine population, and flea-bite hypersensitivity seems to be increasing in cats in many parts of the country.

Peter Miller: There is no doubt FAD is a problem in Australia. Partially because of flea pressure—it is a good climate for insects.

David Young: In central California, the climate is also favorable for year-round flea development, so FAD is an important part of veterinary practice. The incidence is down—perhaps by 60 percent or 70 percent—but there are difficult-to-control cases in which even low-level flea infestation can cause great discomfort.

Pablo Martinez Labat: The incidence of flea infestation of pets is high in Mexico, and only a few of these animals are treated. FAD is common, and many affected animals experience severe lesions and sometimes self-mutilate as a result. Generally speaking, pet owners have little knowledge about fleas, resulting in no efficient control.

Marcelo Labruna: FAD is a very important disease in Brazil. Even with the availability of new insecticides in recent years, it continues to be important because complete prevention of flea infestation of dogs remains a challenge.

John MacDonald: In Alabama, 80 percent of atopic dogs have flea allergy. Since the new products were introduced 10 or 15 years ago, FAD has decreased, but it is on the rise again.

Michael Dryden: In the United States, our ability to manage fleas was almost nonexistent in the 1980s and early 1990s. With the advent of the newer molecules we could manage FAD much better as long as we could keep patients on the products. For a few years after the newer products were launched, it almost seemed like fleas were endangered, but recently they have rebounded. The exact cause for this perceived resurgence is unknown, but it may be related to decreased compliance, ecological factors such as climatic changes, or decreased product efficacy.

Guadalupe Miró: FAD is a severe disease. We don't have many cases at my veterinary teaching hospital in Madrid, maybe because of the climatic conditions of our city, but those we do have are significant. It is important to have good products to use.

Ross Bond: In the United Kingdom, we have significant FAD. A recently published survey of U.K. veterinary practices showed about 21 percent of all initial consultations in small animal practice are skin-related, with flea infestation or allergy among the top four.¹ There are also some data in

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THE BREAKDOWN

- ◆ Flea allergy dermatitis (FAD) is an important disease of dogs and cats and continues to be diagnosed around the world.
- ◆ Flea control with effective insecticides is the cornerstone to managing FAD, although additional methods involving insect growth regulators and environmental control may also be necessary.

this study suggesting cats more frequently carry fleas than dogs, which obviously makes them at risk for an allergy.

MacDonald: Cats are an important part of the picture—they can be the Typhoid Marys of the flea world.

Nariaki Nonaka: In Japan, the population of dogs in homes has increased, and many dogs are infested with fleas. About 10 percent of dogs show signs of FAD.

Luigi Venco: I am a private practitioner in Italy, and flea allergy is probably the most common dermatologic problem that I see.

Johan Van Leuven: FAD used to be the No. 1 allergic disease in Belgium. With the availability of good adulticides and insect growth regulators (IGRs), the incidence has dropped.

STRATEGIES FOR TREATING FAD

Swan: Are our current products sufficient to control flea allergy dermatitis? How do you approach treatment of the disease?

Miró: I believe flea allergy is a multifactorial syndrome. Individual patient characteristics are very important, and the products we use depend on those factors.

Labruna: In Brazil, the best way to manage FAD is to use chemical control directly on the dog combined with environmental product application, mechanical procedures such as vacuuming, and good education of the pet owner about flea biology and control. Treating the dog is one of the most important tools, and in some cases it is the only viable one.

Bourdeau: Studies show if you use any of the modern insecticides properly, it is possible to reduce lesions because you reduce or prevent the allergenic challenge due to flea bites. If you concurrently use anti-inflammatory products like steroids, antihistamines, and shampoos, the clinical signs of flea bite hypersensitivity will resolve more rapidly.

Claudio Genchi: Although with frequent shampooing, you may lose some efficacy of the topical insecticide. My protocol is to use an insecticide once every two weeks if a pet is shampooed once weekly and once a week if a pet is shampooed twice weekly.

Dryden: I think we're very safe with that reapplication frequency, and it is likely effective; however, I often advocate a different approach. It appears nitenpyram rapidly stops flea feeding, and since it's administered orally it won't wash off. If flea control or FAD management is compromised by bathing, I add nitenpyram to the existing regimen. It is a great adjunct therapy to help treat FAD.

Rick Atwell: In our university clinic in Australia, the dermatologists use fipronil spray every two weeks until they have control. They also use prednisone early on to calm pruritus.

Van Leuven: My standard FAD treatment is fipronil spot-on combined with lufenuron. I use some steroids in the beginning to control pruritus, and in multiple-pet households I use an environmental product containing borax. I think it comes down to correct client education. Once clients get a grip on the problem and know it is necessary to use the products in the correct way, then FAD usually is easy to control.

Byron Blagburn: Continuous control is important. Flea allergy is induced much more efficiently by intermittent challenge. If you treat a pet for fleas, allow the population to return, institute another round of treatment, and allow fleas to return again, that cyclical exposure is the most efficient mechanism for triggering flea allergy.

Miller: Will just one bite trigger an allergic response, or does the animal need a certain period of exposure?

Young: In my experience, dogs with FAD cover a spectrum in terms of sensitivity to the antigenic stimulus and also the type of response. Some dogs react to a small number

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of bites, and some need a larger stimulus to initiate clinical signs. Some dogs are primarily pruritic, while others experience terrible skin lesions but hardly scratch. Some dogs present with a mixture of signs.

MacDonald: I find if I apply an effective parasiticide at an appropriate interval, I'll have 99 percent flea control. But if a dog has 40 acres to roam or is in the water for hours a day, I will suspect some infestation breakthrough.

Bond: One complicating factor is until recently, fipronil was a prescription-only medicine in the United Kingdom. But the legal status of the product has changed so that it can be sold now by a veterinarian, pharmacist, or other qualified person without a clinical assessment or prescription. With that change, all the issues we are discussing become even more difficult. If pet owners buy their products on the Internet or from the local drugstore, the opportunity for integrated, strategic flea control by veterinarians is lost.

Miller: We have that problem in Australia, too, although the product is bootlegged. Veterinarians will buy a high volume, sell it to a pet supply store, and take a small profit.

MacDonald: That also happens in the United States. Internet merchants send veterinarians a letter telling them they can make thousands of dollars a month. All they have to do is place an order for the site.

Swan: So if owners can obtain different products on their own, that makes it more difficult for veterinarians to control FAD.

FAD AND COMPLIANCE

Dryden: One of the biggest problems in controlling flea allergy is compliance. The newer topical products have been so effective that as a profession we have become lackadaisical. If we don't educate people that continuous therapy is necessary, they think they can apply the products for a couple of months and then stop. It's probably the same in Europe and other places. We can debate whether we're seeing an increase of FAD,



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but we're definitely seeing increased flea infestations. Also, it appears we are undergoing some climate change. It's not uncommon for practitioners in the midwestern United States to call me about flea problems in November, December, and even January. That never used to happen.

Emmanuel Bensignor: We studied a referral practice in France and found 25 percent of dogs referred for dermatologic problems still had fleas at the consultation, particularly in the winter months. In my clinic last year, I saw fleas most often in November, December, and January. And I don't live in a warm climate.

Bourdeau: We did a study at my university that found that 50 percent of owners did not apply flea products correctly. That is a big compliance problem.

MacDonald: I agree compliance is an important issue. When I have an FAD case,

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- ◆ Client compliance is an important factor in controlling flea allergy, and education is a key factor in achieving good compliance.
- ◆ Poor compliance is the first thing to suspect in reports of a lack of product efficacy. However, in situations of heavy infestation, some animals may still experience allergic outbreaks even with good compliance.
- ◆ All animals in a household must be treated for fleas to maintain control of FAD.

the owners often say they use flea control just like the label says, but that may be every three months.

Bensignor: We probably need to start again with education. Ten or 15 years ago in Europe, there was a good handout for owners that explained the life cycle and control of ticks and fleas. It seemed to solve the problem. Now there is no more interest in the life cycle, and I believe that is a critical point. We need to reeducate our clients.

INTEGRATED MANAGEMENT

Young: Part of the solution may be a return to integrated flea management. When I was in school an integrated approach was drilled into us because the products at the time weren't very successful. Then we got the newer molecules, and the new generation of veterinarians thought these products were the only treatment needed.

Bond: In a study of U.K. general practices,¹ the amount of one product being used was well over 50 percent of the insecticide and acaricide products dispensed for that group of dogs and cats. IGRs were almost never dispensed, and I think that is regrettable.

Blagburn: Environmental control can also be part of the approach in certain situations, particularly those involving severe flea allergy or fleas biting the owner. In those cases clients need to wash pet bedding and vacuum the areas where the pet spends its time, and they need to hire a pest management expert to spray. Not all pest management experts understand fleas, but some are very knowledgeable and can use insecticides safely. I don't encourage clients to buy products from mass-merchandising stores because they don't know how and where to use them.

Bourdeau: Another important point is controlling fleas on other animals.

Dryden: That is an extremely important point. Owners often bring in the dog and not the cat, or the cat and not the dog, and you have to ask about other potential flea hosts in

the home. In the United States, our top three offenders other than the dog and cat are the domesticated ferret, the hedgehog, and the domesticated rabbit. These animals are frequently infested with cat fleas, and if you don't ask, the owner might never tell you about them.

Blagburn: Not addressing other animals in the household is a formula for failure. In a flea-allergic situation it is even more important to target other animals in the household, even neighboring pets if a flea-allergic animal spends time outdoors.

MacDonald: If Grammy is bringing Fifi over to play with the other dogs every Saturday and Fifi is not being treated, a natural repopulation of fleas will occur. You have to figure out the missing link. Fleas don't take taxis to get into the environment.

Swan: So to pull these ideas together, we need to get back to environmental control and integrated pest management and also focus on all the pets in the household.

DEMODICOSIS

Swan: Let's shift gears and discuss demodectic mange. Dr. Fourie has investigated the use of metaflumizone plus amitraz (ProMeris for dogs—Fort Dodge Animal Health) in dogs with demodicosis. How common is demodectic mange in your area, and how is it currently being treated?

Bensignor: In France it's not that common. Practitioners often use ivermectin starting with a low dosage and increasing, but many dogs don't improve. In my opinion, these veterinarians are probably inducing a resistance mechanism in that population of mites. Every year it becomes more difficult to treat severe cases of generalized, chronic demodectic mange.

Dryden: I would agree control is often difficult, but is the mite truly resistant or is the dog's immune system so compromised it cannot recover from the problem? We have been using amitraz here in the United States,

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but in many cases the disease seems to be refractory to amitraz. That has led to off-label use of ivermectin at increasing dosages. The next trials were with milbemycin oxime, which seemed to work well, but it is expensive. I know of no data in the United States on the frequency of demodectic mange, but when it does occur, it is frustrating. To have another treatment option in metaflumizone-amitraz—one that is easy to administer, relatively inexpensive, and, based on Dr. Fourie's work, very efficacious—is exciting. The hair regrowth is quite dramatic (see *Figures 1 and 2*, page 8).

Leon Fourie: There are three important components in managing demodicosis: treating bacterial pyoderma, using an effective miticide, and identifying possible underlying immunosuppressive disease. Many animals need long-term miticidal treatment along with immune system support. It is also important to have a range of compounds with different modes of action that can be alternated to prevent or delay the emergence of resistance. I think metaflumizone-amitraz should be viewed as an effective miticide to be used in conjunction with an effective antimicrobial and other immunosupportive therapies.

Bourdeau: In France the frequency of demodicosis is 1 percent to 2.5 percent of dermatologic cases. I have treated up to 1,000 dogs with amitraz and never failed to help any of them, although duration of treatment is highly variable. But the owners frequently fail. For example, we had one dog with severe demodicosis that was supposedly resistant to amitraz. We treated it in the hospital like all other dogs, and it recovered. So there is no resistance to amitraz in my experience. A specific treatment protocol must be followed, and you cannot expect owners to do it on their own. Also, you must treat for at least two months after clinical cure and one month after negative scrapings from at least five sites. This will reduce the number of relapses.

Fourie: The only way you can say a dog has been cured is through time. You have to assess clinical signs and the presence of



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mites over an extended period of time to determine whether an animal has been cured.

Labat: In Mexico, demodectic mange is not common. Treatment schemes are heterogeneous, sometimes employing acaricides together with antihistamines and in other cases utilizing ivermectin and antibiotics. Many people still use empirical treatments that are very aggressive. It's important to note metaflumizone-amitraz puts the mite in contact with the amitraz for longer periods than amitraz bathing does. I have seen data on the spreadability of the product, and it is amazing. It covers the entire body.

Bond: Demodicosis is not a common disease in my referral practice, but when I do see it, I use amitraz washes once weekly after a total body clip. In the United Kingdom, both the label dose and the label frequency for amitraz are double that in the United States,

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- ◆ Demodicosis is a challenging and often frustrating condition to treat.
- ◆ The three components of managing demodicosis are treating bacterial pyoderma, using an effective miticide, and identifying and managing underlying immunosuppressive disease.
- ◆ Metaflumizone plus amitraz administered monthly to dogs with generalized demodicosis resulted in a more than 95 percent reduction of mite counts after three monthly treatments. Six of seven dogs were free of clinical signs of disease.² (Note: Metaflumizone-amitraz is not approved for the control of mange.)

so we are using four times the amount of drug. We have only rare cases in which amitraz is not efficacious, although clearly some are harder to deal with than others. In some patients, we use oral ivermectin after carefully discussing it with the client and obtaining informed consent for extralabel use.

Miró: I see mostly adult-onset demodicosis, which is usually secondary to another disease that has immunocompromised the dog. A few years ago in Spain, our first treatment was amitraz baths (which I still consider useful), but now most clinicians recommend oral treatments—extralabel oral ivermectin or, in small breeds, moxidectin or milbemycin. With adult demodicosis you must find the primary disease, otherwise you will not have good success. Juvenile demodicosis is different. It is a challenging disease, but you can control it in six or seven months.

MacDonald: In general, the predominant source of adult-onset demodicosis is glucocorticoid therapy for allergic pruritus. I see about six of those cases a month. For the most part, I use systemic therapy with extralabel ivermectin or milbemycin.

Klaus Hellmann: In Germany, demodicosis is a problem but not a frequent one. From my experience conducting clinical studies and the comments I get from veterinarians, a normal-size practice sees one or two cases a month. Licensed products are imidacloprid-moxidectin and amitraz.

Van Leuven: Didn't Dr. Fourie find *Demodex* mites on the dogs after treating them with metaflumizone-amitraz? Wouldn't that indicate only partial efficacy?

Swan: That's a good point. Metaflumizone-amitraz produced a change in clinical signs in demodectic dogs but never completely eradicated the mite in skin scrapings at the completion of the study.

Fourie: Most dogs treated for canine generalized demodicosis will reach clinical normality before negative skin scrapings are



Figure 1. A dog with severe demodicosis.



Figure 2. The same dog after 84 days of treatment with metaflumizone-amitraz.

achieved. According to the literature, dogs are considered cured if they stay mite-free for at least 12 months after the last treatment. The last treatment in our study was on day 56 for the three-treatment group and day 70 for the group that received six treatments.

Blagburn: So with longer treatments, the mites might disappear. Some dogs might require three months or longer to clear the mites.

Swan: Is metaflumizone-amitraz an effective treatment for these animals? Would it be attractive to you in your practice even without 100 percent efficacy, at least initially?

Van Leuven: Yes. It is hard to prove the efficacy of any product in such a complex disease with an immunologic component. It is all about ease of administration. We used to bathe dogs with amitraz, which was cumbersome. Then we switched to oral ivermectin, which is still inconvenient and some dogs don't like the taste. So if there is an easy-to-apply and effective spot-on product, I'd be happy to use it.

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Labruna: Indeed, a monthly spot-on product that provided effective control of demodicosis would be highly valuable. No other treatment protocol relies on a single monthly treatment. And a product that provides additional control of the most important ectoparasites of dogs in Brazil (ticks and fleas) certainly has a significant advantage.

Blagburn: I think metaflumizone-amitraz can have a profound effect on veterinary practice. Many veterinarians will use it even on dogs that don't have demodicosis because the disease can be so problematic. Fleas and ticks have to be controlled. And there's a chance that *Demodex* will have to be controlled. *Demodex* is an attractive target for metaflumizone-amitraz in the U.S. market, and it will remain attractive if clinical research and results in the field continue to support its efficacy.

SARCOPTIC MANGE

Swan: Does anyone have comments on *Sarcoptes* and its treatment?

Dryden: Generally, practitioners have a difficult time finding *Sarcoptes* mites on skin scrapings but a relatively easy time treating it. Selamectin does a good job, along with milbemycin and ivermectin.

Fourie: With sarcoptic mange, the treatment must be 100 percent effective. It is not about reducing mite numbers. If you don't cure a dog, then you will have problems in a short period of time.

Dryden: Especially since it is zoonotic. I recommend that all *Sarcoptes* treatments be administered at the veterinary hospital so we ensure adequate dosing.

Bourdeau: We also have to remember that with sarcoptic mange, some dogs are carriers without any clinical signs.

Bond: Sarcoptic mange is common in southeast England, and the animal that gets the blame is the urban fox. A large number of owners who bring in animals with sarcoptic mange report the presence of local foxes.

Miró: Sarcoptic mange is also a common disease in southern Europe. A huge number of stray dogs live in overpopulated shelters, and then people adopt dogs or puppies from the shelters. *Sarcoptes* is a sanitary problem, and we have to consider it important. To diagnose the disease, we evaluate the response to treatment with selamectin. It is normal in some practices to use ivermectin.

MacDonald: *Sarcoptes* can be easy to miss. It can mimic atopy and food allergy, and sometimes finding the mites on skin scrapings is difficult. Selamectin is my first treatment choice because it is the only label-approved systemic product we have. Once in a while I still use lime sulfur dip, which has a nice antipruritic effect as well as acaricidal activity. I also use extralabel ivermectin, particularly in multiple-pet households where it is economically unfeasible to use selamectin.

Swan: Do you see value in a product that would control mites as well as fleas and ticks?

Bond: In a referral situation where we deal with pruritic animals, it is very useful to have a broad-spectrum parasiticide. We can't stock everything. In my practice we are concerned with both fleas and *Sarcoptes*, and having a product with dual action against those is very important.

TICK-BORNE DISEASES

Rami Cobb: Our next topic is tick-borne diseases. I'm pleased we have a mix of people from different areas of the world, as ticks vary so much geographically. Let's start by discussing the important species in your area and whether tick-borne diseases are perceived as an animal health or human health problem.

TICKS AROUND THE WORLD

Labruna: Two tick-borne diseases are highly important in Brazil: Rocky Mountain spotted fever (RMSF), caused by *Rickettsia rickettsii*, and canine monocytic ehrlichiosis

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- ◆ An effective monthly spot-on product could be a valuable addition to the tools veterinarians use against demodicosis.
- ◆ Sarcoptic mange can be easy to treat but difficult to diagnose. Treatment is important considering the zoonotic nature of the disease.
- ◆ Tick-borne diseases are a significant threat to pets and humans, and the incidence seems to be increasing around the world.

(CME), caused by *Ehrlichia canis*. RMSF is the deadliest vector-borne disease of people in Brazil, and CME is the most important infectious disease in veterinary clinics. The primary vector for CME, *Rhipicephalus sanguineus*, is widely distributed, found in high numbers in all urban areas. RMSF is limited to southeastern Brazil, where dozens of infected people die every year after being infested by *Amblyomma cajennense* or *Amblyomma aureolatum*. Dogs are primary hosts for *A. aureolatum*, making canine infestation a primary risk factor for human RMSF. Veterinarians and pet owners perceive both CME and RMSF as very important—CME because of its threat to dogs and RMSF because of its threat to human life. The public is generally very afraid of ticks.

Bond: Tick-borne disease is becoming an issue in the United Kingdom, particularly with imported pets. Animals that go to European countries—the south of France and Spain, which are popular holiday destinations—risk picking up diseases such as ehrlichiosis and babesiosis, which we rarely see. But tick-transmitted disease is not high-profile. When owners see a tick on the pet, they don't like it, but they're probably not concerned about an infectious agent.

Cobb: Would U.K. veterinarians think of a tick-borne disease if an animal presented with nonspecific signs of illness? Would that form part of the differential diagnosis?

Maggie Fisher: You are right that the clinical signs are not terribly specific. It wouldn't be a first thought for practitioners in the United Kingdom unless they linked it with travel.

Dryden: In the United States, I believe we have seen a rise in the diagnosis of tick-transmitted diseases over the last 10 to 20 years. And the awareness of both pet owners and veterinarians is remarkable compared with what it was 15 years ago. The No. 1 tick-borne disease recognized by most veterinarians and pet owners is Lyme disease, caused by *Borrelia burgdorferi* and transmitted by *Ixodes scapularis*, because of the

significant number of human Lyme cases. Veterinarians also know RMSF, caused by *R. rickettsii*. Although most cases occur in the Carolinas, this disease is on everybody's list because it is transmitted by *Dermacentor*, which is found widely in North America.

Edward Breitschwerdt: In North Carolina, RMSF still has an extremely high mortality rate in dogs and people if not diagnosed and treated appropriately. We also see *Ehrlichia chaffeensis*, *Ehrlichia ewingii*, and *E. canis* infection. *R. rickettsii*, *E. chaffeensis*, and *E. ewingii* are transmitted to people by the same ticks that transmit these pathogens to dogs.

Blagburn: In addition to the diseases mentioned by Dr. Dryden and Dr. Breitschwerdt, we also have *Anaplasma* infection in the United States. I agree U.S. pet owners have become aware of vector-borne diseases because of the high profile of human diseases. But they are generally misinformed. Many pet owners think they can acquire tick-borne diseases directly from their pets when, in fact, pets are sentinels for disease but not necessarily the source.

Bourdeau: In France, canine babesiosis due to *Babesia canis* is the only tick-borne disease that is well-known by veterinarians. That disease covers about 75 percent of the territory and is transmitted by *Dermacentor reticulatus*. Its prevalence is estimated at 1.4 percent. *E. canis* is mainly limited to and known in the southeast. Other tick-borne diseases, such as Lyme borreliosis in dogs, are much less known by practitioners.

Cobb: Professor Genchi, what's happening in Italy?

Genchi: It is similar to France. *Ehrlichia* and *Babesia* are the most important tick-borne pathogens. We have some cases of *Anaplasma* infection—not demonstrated clinically, but serologically. And there is some regional risk of *Borrelia* infection, again shown by serologic evidence with no clinical cases reported.

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Fourie: Both ehrlichiosis and babesiosis are very common in South Africa. Mortality in untreated and peracute cases is high. Complications in the form of autoimmune disease, kidney failure, liver failure, and cerebral damage can be fatal even in treated cases.

Miller: In Australia we have a dog paralysis tick, *Ixodes holocyclus*, that may be unique to our continent. It is our biggest concern in pets and, to some extent, people. The toxin this tick produces is very effective at killing dogs if the tick is not removed within the first few days. Few people die of the disease because they notice and remove the tick, but it can affect people in a similar way. When you have such a potentially fatal infection in your area, it certainly makes you aware of ticks.

Cobb: Dr. Hellmann, are veterinarians in Germany aware of tick-borne disease?

Hellmann: In Germany the awareness is very high. The primary disease is borreliosis, which is found in pets and people. In fact, nearly 50 percent of ticks host *Borrelia*. Also, we used to have only *Ixodes ricinus* in the north, but now we are seeing more *Dermacentor*, probably because of climate change.

Labat: In Mexico the knowledge of tick-borne diseases is still very poor, with the exception of bovine diseases such as babesiosis and anaplasmosis. In Mexico City, which has a population of 32 million, people hardly know ticks exist. There is evidence of ehrlichiosis in small animals in all of Mexico's states, with higher percentages in northern, southeastern, and coastal regions. In Yucatan and surrounding areas, prevalence of *Ehrlichia* in dogs is 46 percent. Infected animals have even been found in places where, in theory, no tick population exists, probably because ticks were transported from densely populated places.

Cobb: How about in Japan?

Nonaka: Our most important tick-borne disease in dogs is babesiosis. We have two *Babesia* species, *B. canis* and *B. gibsoni*. *B.*

canis was previously found only in the southern part of Japan, but its distribution seems to be expanding. We used to find *B. gibsoni* only in hunting dogs, but because of human activity in forested areas, household pets are experiencing much more contact with ticks. We also have *Borrelia* species that are different from those in North America, including two that can infect people.

CHANGING DISEASE PATTERNS

Cobb: A few of you have commented on recent changes in the pattern of tick-borne disease. Are veterinarians adapting readily? Do pet owners recognize that ticks and their diseases are moving into new areas?

Miró: In Madrid we try to educate pet owners about the importance of prevention when they plan to travel with their dogs, as the mobility of companion animals must be a factor in the spread of new disease to our areas. But another concern is that our shelters are filled with stray and abandoned dogs, and these pets are then exported to other countries. We should be more restrictive about the movement of these shelter dogs.

Breitschwerdt: That's a good point. Some rescue groups are so well organized that they will get volunteers to fly jets across the ocean and bring Spanish greyhounds to the United States. International movement of dogs can result in the transport of infected ticks, or, more often, dogs chronically infected with a tick-borne pathogen can carry a new organism to a previously nonendemic location.

Fisher: We have had one case in the United Kingdom of *I. holocyclus*—the tick Dr. Miller mentioned that produces a toxin causing severe clinical signs. It was attached to a bitch from Australia, which began to show respiratory distress and ataxia shortly after arrival. The tick was found and removed, and the dog recovered after supportive treatment. I think this illustrates the speed with which animals are moving around the world now. A disease that is fatal in just a few days can travel to the other side of the world before it shows itself.

NEW OPTIONS IN ECTOPARASITE CONTROL

THE BREAKDOWN

- ◆ Tick-borne diseases are a growing concern, and their geographic distribution is becoming more widespread.
- ◆ The increased movement of pets around the world may be contributing to the spread of ticks and tick-borne diseases.
- ◆ Important diseases transmitted by ticks include Rocky Mountain spotted fever, ehrlichiosis, babesiosis, Lyme disease, and anaplasmosis.

Christian Epe: Practitioners need to start expecting the unexpected. In Germany what we thought were subtropical diseases are now seen in small animal practices. So to make an accurate diagnosis, veterinarians need to consider diseases that are not common in their practices. That requires more diagnostics and a larger diagnostic spectrum than in the past.

Labruna: Twenty years ago, canine infestation with *R. sanguineus* was rare in Brazil. Since then, the tick has become widespread all over the country. Due to the importance of *R. sanguineus*, acaricide use on dogs has increased dramatically during the last 10 to 20 years. Each year, new commercial acaricide products are released in the Brazilian market. However, tick control is still somewhat random and arbitrary.

Dryden: Several factors, including wildlife reintroductions, reforestation, climate change, and changes in agricultural practices and pet movement, all contribute to the apparent dramatic shift in tick populations that we're seeing in the United States. It also appears increasing warm winters have allowed for northward distribution of some tick species. Spread of the lone star tick is a classic example of several of these factors. *Amblyomma americanum* was classically considered a southern tick, and it has now spread through the Midwest and most of the eastern United States. It was first noted in Kansas in about 1972, and now it accounts for more than 80 percent of the ticks we take off of dogs in eastern Kansas in the spring. Increasing populations of white-tailed deer—the preeminent host for *I. scapularis* and *A. americanum*—have dramatically changed the way we deal with and perceive ticks. Some practitioners say they never used to see ticks and tick-transmitted diseases, and now they see them all the time.

Cobb: Is it similar in Europe?

Bourdeau: In Europe the situation is similar to that in the United States. For instance, the deer population has greatly increased in

the last 25 years in France. We are seeing ticks in areas where they were not present before. At the same time, we don't really have the tools to get an accurate view of the situation. Certainly tick populations are moving. They are changing. We have long used and continue to prescribe amitraz collars, which are very effective against ticks. Maybe the efficacy of the current spot-ons is less than the collar, and that is part of why we have seen an increase.

Cobb: Is the awareness of tick-borne disease driving clients to want to control ticks, or do they simply not want to see a revolting parasite on their animal—or both?

Blagburn: In the United States, it depends on the region. Tick-borne diseases and the possibility of Lyme disease and potentially associated glomerular nephritis drive tick control in the Northeast. In the Southeast, it is probably the *Ehrlichia* complex and the repugnant nature of engorged ticks. In the upper Midwest, it is Lyme disease and anaplasmosis. However, we must not forget the importance of other tick-borne diseases like babesiosis and hepatozoonosis.

Genchi: In Italy, pet owners are very worried about ticks and tick-borne diseases, and yet veterinarians tend to treat ticks only when they see them. We need to convince practitioners to initiate tick control programs at the beginning of the season in the same way they do flea control programs rather than simply treating disease or infestation when it occurs.

PREVENTION

Cobb: How effective is prophylactic treatment in the prevention of these tick-borne diseases?

Labruna: Because there is no vaccine for either CME or RMSF, in Brazil the prevention of both diseases is focused primarily on tick control. Every time a dog suffering from a tick-borne disease is treated by a veterinarian, the basic recommendation is tick control since cured dogs remain susceptible to

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reinfection. Pet owners are also concerned about tick control because dogs can harbor hundreds or thousands of ticks and also because *R. sanguineus* is able to colonize homes and is commonly found climbing the walls and furniture. Even though human infestation with *R. sanguineus* is rare, the public is always looking for ways to rid their pets and homes of ticks. In some RMSF-endemic areas, there are public campaigns supported by health authorities to protect dogs from tick infestations through continuous use of an acaricide.

Blagburn: Using a preventive decreases the odds of tick infestation and disease transmission, but it doesn't eliminate it. We need to educate veterinarians about tick habits, the predominant species in their areas, and life stages. They don't have to give clients those lectures, but they can figure out novel ways of introducing that information.

Labruna: The product formulation and recommendations are important as well. An acaricide should be able to kill the ticks infesting a dog at the moment of application and should remain effective for a certain amount of time after that. If a given acaricide shows high efficacy (greater than 95 percent) for no more than 30 days after treatment, dogs should be retreated at an interval no longer than 30 days. Unfortunately, most dog owners do not respect this predetermined interval and retreat their dog only after infestation has reached high levels again.

MacDonald: There is definitely a human nature aspect to this. No matter what great products we have, the bottom line is consistency of treatment—and that's dependent on the pet owner.

Atwell: We did a survey of 577 dogs that had tick paralysis, and 78 percent of the dogs' owners were either not using the product correctly or not using it at all. Even though tick paralysis is lethal and very expensive to treat, people still aren't prepared to use their products correctly and prophylactically. It comes back to education time and time again.



“Practitioners need to start expecting the unexpected. ... To make an accurate diagnosis, veterinarians need to consider diseases that are not common in their practices.”

—CHRISTIAN EPE, DR. MED. VET., PhD, DEVPC

Cobb: Did you discover why people were not using the product or not using it correctly?

Atwell: It was the cost factor and lack of education.

Van Leuven: I think pet owners are looking for simple answers to the tick threat. The more simple the solution, the more likely people will accept prevention.

Cobb: So a product that offers tick protection for the same duration as flea protection would be the ideal solution for those laid-back pet owners who treat again when they see the dog scratching with fleas. Then they're getting the tick control at the same time.

MacDonald: That is why metaflumizone-amitraz really shines. It offers longevity and duration of activity for pet owners who are not as conscientious about frequent treatments or who treat one parasite aggressively but neglect the other.

NEW OPTIONS IN ECTOPARASITE CONTROL

THE BREAKDOWN

- ◆ Despite the increasingly widespread incidence of tick-borne diseases, continuous tick control is not common.
- ◆ Using a preventive product is an important part of preventing tick-borne diseases, but practitioners must also educate their clients about tick habits and life stages.

Cobb: We worked hard to ensure that the metaflumizone-amitraz product had a sufficient dosage of both active ingredients to give a similar period of control. In field studies, we had good control for up to a month on ticks; for the fleas we actually had longer. We have set our recommended retreatment interval on the shorter protection period, so we recommend monthly retreatment. We are very comfortable doing that because of the high safety profile of metaflumizone. We simply could not dose animals enough to make them sick, so it is a remarkably safe pesticide for mammals. In the end, our dosage interval is based on the tick efficacy.

Dryden: In the two studies I did on metaflumizone-amitraz, we had comparable tick efficacy to fipronil and permethrin. With any spot-on product that I've evaluated, it's hard to get remarkably high efficacy at four weeks. We need to recognize that these products are not going to be 100 percent effective in 100 percent of dogs.

Atwell: And it only takes one tick to transmit an infection.

PERCEPTIONS OF AMITRAZ

Cobb: ProMeris for dogs includes amitraz, a well-known compound, as the acaricide. Amitraz has been used for decades, so what are the perceptions of this product among veterinarians and pet owners? Some people have had good experiences, and some people are concerned about potential adverse effects.

Epe: It depends on how you use it. The problems in the past with amitraz occurred with extralabel use of the large animal product and mistakes in dilution and whole-body applications. The metaflumizone-amitraz product is quite different because it is a spot-on.

Labruna: Amitraz is an excellent acaricide; however, its effectiveness as a preventive depends on the residual period of the product. Spray and dip formulations are curative rather than preventive since the residual period is near zero days. In contrast,

metaflumizone-amitraz provides a longer action for amitraz on dogs after a single application, so it is applicable for tick control programs aiming at eliminating ticks infesting dogs in a household and consequently preventing tick-borne diseases.

Miller: I find it intriguing we have had insect control breakthroughs over the last few years, yet we are still using amitraz. It certainly seems to be effective, and nothing better has come out.

Cobb: When you compare how quickly amitraz can clear animals of parasites—whether you are talking about livestock or companion animals—it is a rapid clearance.

MacDonald: General practitioners find amitraz somewhat user-friendly, and it is still the only licensed product on the market in the United States for miticidal therapy. Although some veterinarians are using extralabel milbemycin and ivermectin, many still utilize amitraz dip as a miticide. Familiarity and acceptability are important factors. With amitraz collars, some people are concerned about toxicity if the compound is ingested by the pet, which is not uncommon. That makes a topical application of amitraz a lot more appealing.

Blagburn: In the United States, we get positive and negative feedback about the use of amitraz. The positive comes from veterinarians who have used a preventive collar alone or with other products with great success. Negative comments occasionally come if a puppy chews an amitraz collar and becomes sleepy. Also, to treat demodicosis we use a more dilute amitraz concentration at wider intervals than veterinarians do in Europe, so our efficacies against *Demodex* have been mediocre.

Fourie: In South Africa, amitraz is widely used on livestock.

Labat: In Mexico, amitraz has been used intensively to combat cattle ticks, and in the southeastern region there have been reports

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of resistance. However, many veterinarians assume any product failure is due to resistance, and these reports have not been verified. In dogs the use of amitraz has been focused on demodectic mange and not ticks.

Epe: What about the environmental concerns with amitraz? I heard ProMeris referred to as a green product that is safe for the environment. If amitraz is an active ingredient, can you still say it is environmentally safe?

Cobb: We put much less amitraz on the dog to get the necessary efficacy. We have no bath water to dispose of into the environment. We know that it cannot be rubbed off the hair to any extent, even if the dog is lying on your sofa or your bed. Environmentally it is superior to any other form of amitraz that has been available to this point.

In terms of household risk from one pet licking another, we found that because of the excipient in the formulation, dogs and cats don't like it. If you try to dose them orally they resist, and if you do dose them orally they start to salivate and drool. So in a household situation, I think there would be avoidance behavior.

TICK CONTROL STRATEGIES

Cobb: So how do we develop effective tick control strategies?

Blagburn: It goes back to education. We use vaccination if we have it for important vector-borne diseases. We use tick avoidance strategies, which include knowing when ticks are active, what species and stages are active, and what species transmit what. Then we encourage compliant use of effective products. That is what I continue to preach because I really don't know any other way to do it.

Dryden: The good news is that we are starting to see big changes in tick control. It used to be a lot like flea control—it was reactive. Now we're seeing more of a preventive approach, like with heartworm. There are many places in the United States that don't have a non-tick season anymore, so people are moving from reactive control



“We need to convince practitioners to initiate tick control programs at the beginning of the season in the same way they do flea control programs rather than simply treating disease or infestation when it occurs.”

—CLAUDIO GENCHI, DR. MED. VET., PhD, DEVPC

to year-round prevention. It appears that whatever we used to think about tick populations, tick distribution, and tick-vector-borne diseases is changing. It is changing for various reasons in various countries and continents, but it is changing.

Cobb: We are at the end of our roundtable discussion. I thank you all for your contributions and the expertise you brought to the table from around the world. I hope you have learned something useful—I know I have.

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