How to pick your way through the jungle of ectoparasite treatments for dogs and cats

Peri Lau-Gillard, who operates as a freelance dermatologist in the South West with clinics at Cave Veterinary Specialists, Rowe Veterinary Group and Vale Vets, reminds us of the particular properties of the products on offer for controlling ticks, mites and insects of veterinary importance.

This article provides a brief summary of the various active ingredients and formulations of insecticides and acaricides currently authorized for use in dogs and cats in the United Kingdom, in order to help the busy practitioner to find his/her way through the jungle of products available. Although legislation for pets entering the UK no longer requires tick treatment, travelling pets are still at risk of contacting ‘exotic’ diseases such as ehrlichiosis, dirofilariasis (heartworm) and leishmaniosis when abroad through contact with the arthropod vectors and should be protected appropriately. For more information on changes to the legislation regarding treatment of travelling pets please see the article on p24 of this issue of companion.

Insecticides
Insects of veterinary importance in small animals include fleas, chewing and sucking lice, mosquitoes and certain flies (e.g. phlebotomine sandflies).

Imidacloprid (Advantage spot on®, Bayer plc)
- Advantages: Adulticidal activity against fleas on contact within 24 hours; larvicidal in environment; authorized for flea control in rabbits; will control biting lice in dogs.
- Disadvantages: No repellent (anti-feeding) action; reduced efficacy after bathing/swimming; occasional application site reactions.
- Comments: The only flea product authorized for use in rabbits.

Imidacloprid + permethrin (Advantix spot on for dogs®, Bayer plc)
- Advantages: Adulticidal activity against fleas on contact within 24 hours; larvicidal in environment; acaricidal and repellent efficacy against ticks for 3 weeks; repellent activity against sandflies for 2–3 weeks; repellent activity against mosquitoes for 2–4 weeks; repellent activity against stable flies for 4 weeks.
- Disadvantages: Reduced efficacy after bathing/swimming; occasional application site reactions.
- Comments: Do not use on cats (toxic). Has repellent activities.

Imidacloprid + moxidectin (Advocate spot on®, Bayer plc)
- Advantages: Control of canine Sarcoptes and Demodex mites, feline and canine Otodectes mites, feline and canine roundworm and hookworm, canine whipworm, and canine biting lice. Authorized for the prevention of heartworm (active against L3 and L4 larvae of Dirofilaria immitis) in dogs, cats and ferrets. Prevention and treatment of canine angiostrongylosis and treatment of canine lungworm (Crenosoma vulpis). For the treatment and prevention of flea infestation (Ctenocephalides felis) in dogs, cats and ferrets.
- Disadvantages: No repellent action; reduced efficacy after bathing/swimming; occasional application site reactions.
- Comments: The only anti-flea and heartworm prevention product authorized for use in ferrets.

Fipronil (Frontline Spray® or Frontline spot on®, Merial Animal Health Ltd; Fipродог® or Fiprocat®, Dechra Veterinary Products Ltd; Fiprospot®, Ceva Animal Health Ltd; Effipro spray® or Effipro spot on®, Virbac Ltd; Fiproline, Francodex, SAS & 4Fleas Fipronil, Alphamed SAS)
- Advantages: All products kill adult fleas. Effipro spot on® also effective for tick infestation in dogs and cats, whereas...
### Trade name
- **Advantage:** Imidacloprid
  - **Active ingredient:** **Imidacloprid**, **Permethrin**
  - **Presentation:** **Spot-on**
  - **Species:** **D**
  - **Minimum age:** 7 weeks
  - **For first use:** 7 weeks
  - **Fleas:** ✓
  - **Biting lice:** ✓
  - **Flies:** ✓✓
  - **Ticks:** ✓✓✓
  - **Demodex:** ✓
  - **Sarcoptes:** ✓
  - **Ear mites:** ✓
  - **Feces:** ✓
  - **Bladder Heart Flies:** ✗
  - **Ticks:** ✓✓✓
  - **Ivermectin:** ✗
  - **Frequency of use:** Weekly
  - **Use with other:** ✓

### Trade name
- **Advantage:** Imidacloprid
  - **Active ingredient:** **Imidacloprid**, **Moxidectin**
  - **Presentation:** **Spot-on**
  - **Species:** **C,D,F**
  - **Minimum age:** 9 weeks
  - **For first use:** 7 weeks
  - **Fleas:** ✓
  - **Biting lice:** ✓
  - **Flies:** ✓✓✓
  - **Ticks:** ✓✓✓
  - **Demodex:** ✓
  - **Sarcoptes:** ✓
  - **Ear mites:** ✓
  - **Feces:** ✓
  - **Bladder Heart Flies:** ✗
  - **Ticks:** ✓✓✓
  - **Ivermectin:** ✗
  - **Frequency of use:** Every 2 weeks max.

### Trade name
- **Advantage:** Nitenpyram
  - **Active ingredient:** **Nitenpyram**
  - **Presentation:** **Tablet**
  - **Species:** **C,D**
  - **Minimum age:** 4 weeks
  - **For first use:** 4 weeks
  - **Fleas:** ✓
  - **Biting lice:** ✓
  - **Flies:** ✓✓
  - **Ticks:** ✗
  - **Demodex:** ✓
  - **Sarcoptes:** ✓
  - **Ear mites:** ✓
  - **Feces:** ✓
  - **Bladder Heart Flies:** ✗
  - **Ticks:** ✓✓✓
  - **Ivermectin:** ✗
  - **Frequency of use:** 4 weeks

### Trade name
- **Advantage:** Fipronil
  - **Active ingredient:** **Fipronil**
  - **Presentation:** **Spray**
  - **Species:** **C,D**
  - **Minimum age:** 8 weeks
  - **For first use:** 2 days
  - **Fleas:** ✓✓
  - **Biting lice:** ✓✓
  - **Flies:** ✓✓
  - **Ticks:** ✗
  - **Demodex:** ✓
  - **Sarcoptes:** ✓
  - **Ear mites:** ✓
  - **Feces:** ✓
  - **Bladder Heart Flies:** ✗
  - **Ticks:** ✓✓✓
  - **Ivermectin:** ✗
  - **Frequency of use:** 4 weeks

### Trade name
- **Advantage:** Fipronil
  - **Active ingredient:** **Fipronil**
  - **Presentation:** **Spot-on**
  - **Species:** **C,D**
  - **Minimum age:** 8 weeks
  - **For first use:** 2 days
  - **Fleas:** ✓✓
  - **Biting lice:** ✓✓
  - **Flies:** ✓✓
  - **Ticks:** ✗
  - **Demodex:** ✓
  - **Sarcoptes:** ✓
  - **Ear mites:** ✓
  - **Feces:** ✓
  - **Bladder Heart Flies:** ✗
  - **Ticks:** ✓✓✓
  - **Ivermectin:** ✗
  - **Frequency of use:** 4 weeks

### Trade name
- **Advantage:** Fipronil(s)-methoprene
  - **Active ingredient:** **Fipronil(s)-methoprene**
  - **Presentation:** **Spot-on**
  - **Species:** **C,D**
  - **Minimum age:** 8 weeks
  - **For first use:** 2 days
  - **Fleas:** ✓✓
  - **Biting lice:** ✓✓
  - **Flies:** ✓✓
  - **Ticks:** ✗
  - **Demodex:** ✓
  - **Sarcoptes:** ✓
  - **Ear mites:** ✓
  - **Feces:** ✓
  - **Bladder Heart Flies:** ✗
  - **Ticks:** ✓✓✓
  - **Ivermectin:** ✗
  - **Frequency of use:** 4 weeks
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Frontline spray®, Frontline spot on® and Effipro spray® will additionally treat canine and feline biting lice infestations. Sprays can be used on puppies and kittens older than two days.

- Disadvantages: No repellent action; no larvicidal/ovaricidal activities; reduced efficacy after bathing/swimming; occasional application site reactions; spray is labour-intensive.
- Comments: Do not use on rabbits (toxic).

Fipronil + (S)-methoprene
(Frontline Combo spot-on for dogs and cats, Mérial Animal Health Ltd)

- Advantages: Adulticidal, larvicidal and ovaricidal activities against fleas; effective against ticks and/or biting lice in dogs and cats.
- Disadvantages: No repellent action; reduced efficacy after bathing/swimming; occasional application site reactions.
- Comments: Do not use on rabbits (toxic).

Fipronil + (S)-methoprene + amitraz
(Certifect spot-on solution for dogs, Mérial Animal Health Ltd)

- Advantages: Adulticidal, larvicidal and ovaricidal activities against fleas; effective against ticks and/or biting lice in dogs. Affects a wider range of tick species than Frontline Combo, increased speed of kill (starting at 2 hours and >90% at 24 hours) and a longer duration of activity. Unlike other products, dead and dying ticks fall off the patient.
- Disadvantages: Reduced efficacy after bathing/swimming; occasional application site reactions.
- Comments: Do not use on rabbits or cats (toxic). People with diabetes mellitus or taking monoamine oxidase inhibitors (MAOI) should take particular care when handling the product.

Selamectin (Stronghold spot on®, Pfizer Ltd)

- Disadvantages: No repellent action; reduced efficacy after bathing/swimming; occasional application site reactions reported.
- Comments: Very wide spectrum product.

Metaflumizone (ProMeris spot on for cats®, Pfizer Ltd)

- Advantages: Kills adult fleas on contact. Authorized for the treatment and prevention of infestations by ticks, treatment of canine demodicosis and canine biting lice.
- Disadvantages: No repellent action; reduced efficacy after bathing/swimming; side effects (sedation, lethargy, CNS depression, hyperglycaemia, bradycardia) can be seen; strong odour of product (author’s own experience).
- Comments: People taking MAOI-containing medication or who have diabetes should take particular care when handling the product. Potential risk of dogs developing drug-induced pemphigus foliaceus.

Metaflumizone + amitraz (ProMeris Duo®, Pfizer Ltd)

- Advantages: Kills adult fleas on contact. Authorized for the treatment and prevention of infestations by ticks, treatment of canine demodicosis and canine biting lice.
- Disadvantages: No repellent action; reduced efficacy after bathing/swimming; occasional application site reactions (temporary oily appearance, clumping/spiking of the coat, colour change of fur). Slow acting (2–4 days).
- Comment: Clients may not be happy with oily coat appearance and possible coat colour changes.
Pyriproxy (Practic spot on solution for dogs®, Novartis Animal Health UK Ltd)

- Advantages: Kills adult fleas within 24 hours; kills ticks within 48 hours.
- Disadvantages: Not suitable for cats; no repellent action; fur discoloration, greasy appearance/clumping of the fur, alopecia or pruritus may be observed at the application site.
- Comments: Do not use in rabbits. Weekly immersion in water does not affect efficacy against fleas/ticks, but dogs should not be bathed/shampooed from 48 hours before treatment and/or within 24 hours after treatment.

Nitenpyram (Capstar tablet®, Novartis Animal Health UK Ltd) (Other products with the same active ingredient are available)

- Advantages: Kills 95–100% of adult fleas within 6 hours; can be given to animals at all stages of pregnancy or lactation.
- Disadvantages: No repellent action; no larvicidal/ovaricidal activities against fleas.
- Comments: Not for use as sole anti-flea therapy.

Spinosad (Comfortis chewable tablet for dogs®, Elanco Companion Animal Health)

- Advantages: Rapid onset of action and long duration (one month); therefore almost complete prevention of appearance of flea eggs in the environment.
- Disadvantages: Cannot be used in cats. Cannot be used in dogs weighing <3.9 kg as accurate dosing not possible. Do not use in dogs with pre-existing epilepsy. Product may interact with other P-glycoprotein substrates (e.g. digoxin, doxorubicin, ciclosporin). Vomiting commonly occurs in the first 48 hours after dosing, but is transient, mild and does not require symptomatic treatment.
- Comments: Comfortis is authorized for use in cats in the USA – so watch this space!

Deltamethrin (Scalibor Protectorband for dogs®, MSD Animal Health)

- Advantages: Control of infestations with ticks and sandflies (Phlebotomus perniciosus) for 5–6 months; anti-feeding effect on adult mosquitoes (Culex pipiens) for 6 months; can be used during pregnancy and lactation. Long acting!
- Disadvantage: Collar maybe not convenient for owner; strong smell; local reactions may occur.
- Comments: Prevent dog from swimming in water for the first 5 days of wearing the collar.

Insect growth regulator inhibitors

Lufenuron (Program tablet for dogs®, Program suspension for cats®, Program suspension for injection for cats, Novartis Animal Health UK Ltd)

- Advantages: Inhibition of chitin synthase results in flea eggs failing to hatch. Can be given to pregnant bitches and queens, lactating queens and puppies/kittens taking solid food; injection for cats lasts 6 months.
- Disadvantages: No effect against adult fleas; time lag of 60–90 days required to disrupt flea life cycle; no repellent activity.
- Comments: Adulticide flea treatment needed concurrently.

Lufenuron + milbemycin (Program Plus tablet for dogs®, Novartis Animal Health UK Ltd)

- Advantages: Prevention of fleas; prevention of heartworm disease (L1 & L2 stages of Dirofilaria immitis); treatment of adult stages of gastrointestinal nematodes (hookworms, roundworms and whipworms) in dogs. It can be used from 2 weeks of age.
- Disadvantages: Not suitable for cats; time lag of 60–90 days required to disrupt flea life cycle; no repellent activity.
- Comments: For heartworm-positive dogs, adulticidal therapy is indicated before administering Program Plus.

Acaricides

Products for tick control

- Deltamethrin (Scalibor Protectorband for dogs®, MSD Animal Health)
- Fipronil (Frontline Spray® or Frontline spot on®, Virbac Ltd; Effipro spray® or Effipro spot on®, Virbac Ltd)
How to pick your way through the jungle of ectoparasite treatments for dogs and cats

- **Fipronil + (S)-methoprene** (Frontline Combo spot-on for dogs and cats, Mérial Animal Health Ltd)
- **Fipronil + (S)-methoprene + amitraz** (Certifect spot-on solution for dogs, Mérial Animal Health Ltd)
- **Imidacloprid + permethrin** (Advantix spot on for dogs®, Bayer plc)
- **Imidacloprid + moxidectin** (Advocate spot on®, Bayer plc)
- **Metaflumizone + amitraz** (ProMeris spot on for dogs®, Pfizer Ltd)
- **Pyriprole** (Prac-tic spot on solution for dogs®, Novartis Animal Health UK Ltd)
- **Selamectin** (Stronghold spot on®, Pfizer Ltd)

**Products to treat sarcoptic mange**

- **Amitraz** (Aludex cutaneous solution for dogs®, MSD Animal Health)
  - Advantages: Very effective.
  - Disadvantages: Not user-friendly (see product insert for handling and application directions); cannot be used on Chihuahuas, pregnant or lactating bitches or puppies <3 months old; concurrent use with other alpha-2 adrenoceptor agonists not recommended. Known side effects include skin irritation, sedation, lethargy, CNS depression and bradycardia; these usually subside in 24 hours; if they are severe or persistent, the patient should be washed in warm water and dried, and use of a reversal agent (atipamezole 0.2 mg/kg i.m.) considered.
  - Comments: Amitraz is an MAO inhibitor and should not be used on dogs or applied by anyone taking other MAO inhibiting drugs. Care is needed if the drug is being handled by a diabetic owner or applied to a diabetic patient, as they may develop transient hyperglycaemia. Do not use on cats or horses.
- **Selamectin** (Stronghold spot on®, Pfizer Ltd)
- **Imidacloprid + moxidectin** (Advocate spot on®, Bayer plc)

In-contact animals and the environment should be treated concurrently.

**Products to treat canine demodicosis**

- **Amitraz** (Aludex cutaneous solution for dogs®, MSD Animal Health)
  - Advantages, disadvantages and comments as above for Amitraz in treating sarcoptic mange.
- **Imidacloprid + moxidectin** (Advocate spot on®, Bayer plc)
- **Metaflumizone + amitraz** (ProMeris spot on for dogs®, Pfizer Ltd)

**Products to treat cheyletiellosis**

Currently there are no products authorized for this use, although reports have shown that fipronil- and selamectin-containing products are effective. Alternative treatments include weekly lime sulphur dips, or weekly bathing with 1% selenium sulphide shampoo over 3 consecutive weeks. In-contact animals and the environment should be treated concurrently.

**Products to treat trombiculidiasis**

To the author’s knowledge there is currently no authorized product available, but there is evidence in the literature that fipronil- and selamectin-containing products may be effective.

**Products to treat otocariosis**

- **Imidacloprid + moxidectin** (Advocate spot on®, Bayer plc)
- **Selamectin** (Stronghold spot on®, Pfizer Ltd)
- **Tiabendazole** (Auroto ear drop solution®, Dechra Veterinary Products Ltd)

In-contact animals and the environment should be treated concurrently.

References and further reading available at the companion area of BSAVA.com