Periodic Graphics

A collaboration between C&EN and Andy Brunning, author of the popular graphics blog *Compound Interest*

**FLEA AND TICK TREATMENTS FOR PETS**

Want to protect your cat or dog from creepy-crawlies? Here, we look at a range of treatments for fleas and ticks, the active ingredients in them, and how they stop parasites in their tracks.

**FLEAS AND TICKS**

Fleas and ticks are pests that can cause problems for pets and their owners. Fleas are most common on dogs and cats and can cause allergic dermatitis. Ticks are more commonly found on dogs than cats and can pass on several diseases to pets, including Lyme disease.

**MECHANISMS AND SIDE EFFECTS**

Flea and tick medications work in a variety of ways. Many, such as neonicotinoids, target insect-specific receptors, so they don’t harm pets. In rare cases, though, some medications can cause side effects in animals.

**COLLARS**

Collars are impregnated with compounds that are released at a controlled rate to kill parasites. Many collars combine imidacloprid (a neonicotinoid) for fleas with flumethrin (a pyrethroid) for ticks.

**ORAL MEDICATIONS**

These transfer into your pet’s tissues and are picked up by feeding bugs. Lufenuron stops flea eggs from hatching; niterypyram targets adult fleas. Afoxolaner kills fleas and ticks by disrupting their nervous systems.

**TOPICAL TREATMENTS**

These include shampoos, powders, and spot-on treatments. Ingredients include imidacloprid and fipronil, which disrupt the nervous systems of fleas and ticks, and pyriproxyfen, which disrupts their development.

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