



Best Practice Guidelines for the Responsible Use of Parasite Control in Pets

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# INTRODUCTION

EPRUMA was established in 2005 to promote the responsible use of medicines in animals (www.epruma.eu) and share information on best practices to tackle challenges which may compromise the health of animals, people and eco-systems. This guideline explains the value of targeted, properly handled and effective ecto- and endoparasite controls for pets and shares recommendations to optimise the health of pets, people, and the environment in a One Health approach.

EPRUMA partners recognise that climate change has caused **increasing changes in distribution and infestation rates**, and overall survival of parasites, as well as transmission rates of vector-borne diseases. In order to maintain safe, effective and affordable parasite treatment and control options for all animal owners, management strategies must be specifically adapted to the individual animal needs. As the misuse of parasite protection products may lead to development of resistance, EPRUMA partners promote responsible use of veterinary parasite protection and control products in companion animals.



## GENERAL INFORMATION ABOUT PARASITES

Parasites like fleas, ticks, mites, protozoa and worms are a permanent risk for pets, and potentially people. They can cause pain, discomfort, and illness that can even be life-threatening if left untreated. In addition, some pet parasites and the diseases they cause are zoonotic<sup>1</sup>, which puts our health at risk (see table below). Significant health benefits come from using parasite control to prevent or treat parasitic infestation and associated diseases in pets and people.

Safeguarding parasite prevention and treatment options is vital and highly depends on correct use of licensed veterinary medicines.

#### Parasites can be classified as ectoparasites and endoparasites.

Ectoparasites live on the outside of animals, such as the skin (e.g., fleas, ticks), ear canal (ear mites), hair follicles or epidermis layers (mange mites), and hairs (lice). Ectoparasites can be permanent parasites (e.g., fleas, lice, mites), temporary parasites (e.g., ticks) or intermittent parasites (e.g., mosquitoes, sandflies).

#### Ectoparasites are split into two groups:

Insecta Fleas	<ul> <li>Small, wingless, blood-sucking insects that rapidly multiply. Sometimes difficult to detect until they appear in large numbers.</li> </ul>
Re Cit	<ul> <li>Act as vectors for a number of zoonotic pathogens, e.g., bacteria like Rickettsia and Bartonella, and also act as intermediate hosts for the Dipylidium tapeworm.</li> </ul>
	Flea infestation often leads to severe skin allergies.
Lice	<ul> <li>Cause direct and pruritic damage to the skin of affected animals.</li> </ul>
<b>Ť</b>	<ul> <li>Sucking lice feed on blood and can act as vectors for bacteria like Rickettsia, and biting lice may transmit Dipylidium tapeworms.</li> </ul>
Mosquitoes	<ul> <li>More than 3,500 known mosquito species have been identified worldwide.</li> </ul>
¥ 🤹	<ul> <li>Feed on blood, act as vectors for important human diseases, such as malaria, dengue, zika, yellow fever, West Nile fever and lymphatic filariasis.</li> </ul>
	<ul> <li>Also transmit zoonotic diseases such as the heartworm Dirofilaria immitis and the sub-cutaneous worm Dirofilaria repens.</li> </ul>
Sandflies	<ul> <li>Act as vectors for important vector-borne and zoonotic disease like Leishmania. Leishmania infantum is a serious pathogen for dogs and also for people, especially children and immunodeficient adults.</li> </ul>
	<ul> <li>Can also transmit human viral diseases like phlebovirus.</li> </ul>
Acari	<ul> <li>Cause dermatitis and manae.</li> </ul>
Mites	<ul> <li>Long-lasting and intense treatment may be required.</li> </ul>
X III	• Certain mites are even zoonotic and cause (pseudo) scabies in humans.
Ticks	<ul> <li>Present worldwide in all climatic zones and on all land-based animal species. Certain species have also spread into new regions in Europe due to changes in weather patterns and international movement of infested animals.</li> <li>Feed on blood, and very potent vectors of human or zoonotic bacteria, like Borrelia (Lyme</li> </ul>
	disease), Ehriichia, Anaplasma, Rickettsia (spotted tevers); viruses like Tick-borne-encephalitis virus, Crimean-Congo haemorrhagic fever, and animal protozoa like Babesia Cytauxzoon, Hepatozoon.

1: According to WHO, a zoonosis is an infectious disease that has jumped from a non-human animal to humans. Zoonotic pathogens may be bacterial, viral or parasitic, or may involve unconventional agents and can spread to humans through direct contact or through food, water or the environment. They represent a major public health problem around the world due to our close relationship with animals in agriculture, as companions and in the natural environment. Zoonoses can also cause disruptions in the production and trade of animal products for food and other uses.

**Endoparasites** live in animals' tissues and organs, such as the intestine (roundworms, tapeworms, hookworms, protozoans Giardia and Coccidia), the heart (heartworms), lungs (lungworms), blood (piroplasms), but many other organs can also be affected by other parasite species, such as the bladder, oesophagus, liver, kidney, eye, etc. Some parasites may have a wide body tissue distribution like Leishmania or Toxoplasma.

#### Endoparasites are split into two groups: Helminths and Protozoa.

Intestinal worms: tapeworms, ascarids, hookworms, whipworms	<ul> <li>Spread via the oral-faecal route or contaminated water. Can also be spread through the ingestion of intermediate hosts like fleas or mice. Fox tapeworms are of particular zoonotic concern.</li> <li>After infection many nematode larvae (ascarids, hookworms) migrate through different organs and tissues to invade the intestine. Hookworms feed on intestinal blood and damage tissues. Ascarids and tapeworms feed on nutrients and may cause deficiencies.</li> <li>Ascarids from pets can also infect humans and can cause flu-like symptoms, migraines, or ocular disease.</li> </ul>
Non-intestinal worms: heartworms, lungworms, subcutaneous worms and eye worms	<ul> <li>Helminths that reside in blood or lymphatic vessels, heart, lungs, skin or eyes.</li> <li>Transmitted by arthropod vectors (such as mosquitoes) or by ingestion of intermediate hosts (such as snails), or paratenic hosts (such as mice, birds).</li> <li>Heartworm and lungworm are of significant medical importance for infected dogs and cats. Untreated infections can be lethal.</li> </ul>
Protozoa	<ul> <li>Single cell organisms that can be located at various sites, e.g. intestines, tissue, blood cells.</li> <li>Infection can occur either by oral uptake or by vector transmission.</li> <li>Can cause serious diseases such as malaria (humans), giardiosis, leishmaniosis and toxoplasmosis (zoonotic); babesiosis, hepatozoonosis, cytauxzoonosis (animals).</li> </ul>

### The lifecycle of a parasite

Throughout their life, parasites undergo interactions with the host(s) and the environment. They rely on their host(s) to develop, to survive and to reproduce.

The lifecycle of a parasite typically consists of several stages, which can vary depending on the type of parasite. For example, from eggs or larvae to the reproducing adult stage, often with intermediate hosts. However, a common pattern includes the following stages:



Breaking the parasite lifecycle is a key strategy for preventing parasitic diseases and, for that, it is essential to understand each individual parasite's lifecycle and respective prevention strategies.



# **PREVENTION MEASURES**

It is essential to prevent parasitic diseases not only to protect animal and human health, but also to preserve the human-animal bond. Various measures can be taken to disrupt the lifecycle and reduce the spread of parasites, including:

- > Tailored plans according to individual needs
- Vector exposure control
- Hygiene and biosecurity measures
- Avoiding contact with wildlife
- Paying attention during travel
- Quarantine measures

**TIPS FOR VETS:** 

Enhanced measures may be needed for kennels and rescue shelters

**Establish a pet-specific parasite management plan:** There is no "one size fits all" solution. Take into account the individual animal-specific parameters like lifestyle and behaviours, age, weight, surroundings, local-specific endemic or emerging epidemiology, etc. to establish the right individual parasite control plan as part of the animal's health plan. Active and continuous pet owner education on parasites and health risks and appropriate application of parasite control products is important.

Choose the appropriate parasite control product(s): Several products are available for different pet species, differing in scope for protection, duration and ease of administration. Professional advice, as part of the pet-specific parasite management plan is essential.

**Hygiene:** Practice good hygiene measures such as cleaning and disinfecting the consultation room from patient to patient. Keeping the waiting room clean is also advisable.

Advise on zoonotic risks: Owners should be informed of the potential risks of zoonotic disease, especially those with increased risk (pregnant woman, children, elderly people, sick or immunosuppressed people).

Share insights gleaned from diagnostic tests: Regular routine diagnostic testing will help with monitoring the prevalence of certain parasites in the local area and support better advice for animal-owners on parasite-specific prevention actions.

Warn of invasive and non-native parasites: Veterinarians have a frontline duty to identify invasive or non-native parasites that have entered the country via movement of animals or natural means (i.e., expansion of tick range due to climate change), to prevent further spread.

Take appropriate measures for transport and quarantine<sup>2</sup>: Ensuring the animal is free of parasites and fit to travel is a very important veterinary task. In case of need, quarantine can be used for infested animals or animals with an unknown parasitic status.

**Encourage interprofessional collaboration:** Advocate for better engagement between the veterinary medicine and human medicine professions to ensure greater understanding of parasite control for protection of public health.

2: According to the EU Animal Health Law, Quarantine means the keeping of animals in isolation with no direct or indirect contact with animals outside the epidemiological unit, for the purpose of ensuring that there is no spread of one or more specified diseases while the animals in isolation are undergoing observation for a specified length of time and, if appropriate, testing and treatment;



### **TIPS FOR ANIMAL OWNERS:**

Animal owners can take several measures to help prevent parasite infestation, but this will never replace veterinary advice. It is always advisable to consult a vet and ask for advice about parasite control when adopting or buying a new animal. Continuous monitoring should become a routine part of regular vet visits.

#### Parasite exposure control:

- Understand which living conditions, environments and animal behaviours encourage parasite presence and infestations.
- Know how to identify and minimise parasite breeding sites.
- Use approved control products, indicated for the parasite(s) in question.

#### Hygiene:

- Keep the animal's surroundings clean (e.g., regular washing, disinfection), including items such as brushes, bedding or transport boxes.
- Ensure general hygiene and regular vacuuming. Minimise access to vegetal and other humid waste.

#### **Outdoor activity:**

- Avoid shared-space animal facilities and contact with other animals if your animal's parasite control is not up-to-date.
- During walks, bring water with you to try to avoid your pet drinking from other water sources.
- Carefully pick up all your pets' faeces and dispose of them appropriately.
- Visually inspect for ticks on return home.

#### Control contact with wildlife:

• As wildlife can pass on an important number of parasites, restrict passage for wildlife to enter spaces your pet has access to, as far as possible (foxes are an important reservoir of canine parasites, e.g., echinococcus, lungworms, scabies).

#### Tick removal:

- Know how to remove ticks correctly and quickly (check the video linked in the resources section).
- Avoid the use of oil, alcohol, or ether to remove ticks.
- Remove ticks as soon as possible to avoid possible transmission of vector borne diseases.
- Always dispose of any ticks correctly to make sure they don't shed eggs or attach to another host.

#### **Travel and transport:**

- Ask your vet for advice, as animal movement helps facilitate the export and import of non-endemic parasite species.
- Be aware of national legislation on requirements for the health status of your pet before travelling abroad.
- Be aware of geographic areas with a high parasite presence when travelling with your pet or when adopting a pet from abroad. You can find several maps on our references document.

#### Contributions to the advancement of scientific knowledge

In some EU countries, local organisations or universities encourage people to submit ticks collected from pets to validate their identification. You can find more information on who is doing this and how to participate in our references document.

### **Ensuring a One Health approach**

Proper parasite control is essential and a permanent task for the animal health industry, veterinarians and pet owners.

EPRUMA strongly supports a One Health approach for protection from parasites and is convinced that through responsible use of parasite control, human, animal, and environmental health can be protected. Animal owners should be aware of the potential risks of zoonotic spillover, in particular for high-risk groups such as pregnant women, ill or immunosuppressed people, but also children.

EPRUMA partners encourage better engagement between the veterinary medicine and human medicine professions to ensure better awareness of the One Health risks of parasite infestations.



## DIAGNOSIS

Accurate diagnosis is crucial for targeted and effective treatment of parasitic diseases.

Animal owners can help veterinarians to make their diagnosis by monitoring and reporting observed changes in the animal's behaviour, appetite, water consumption, bodyweight, and other symptoms. Experienced animal owners will often be able to spot parasites visible to the naked eye, i.e., fleas, ticks, tapeworm.

Veterinarians will also consider parasite infestation per the regional epidemiological situation and lifestyle of the animal (e.g. outdoors access, hunting habits, presence of wildlife, ...)



Veterinarians can diagnose **Ectoparasites** through a variety of diagnostic methods, including:

- Visible presence of the parasite e.g. ticks, fleas, flea faeces, lice on the skin, coat or fur.
- Cutaneous disorders caused by ectoparasite infestation (e.g., flea allergy dermatitis)
- Deep skin scrape sample (for mange mites)
- Otoscopy and/or swab sample (ear mites)
- > Tape strip for surface mites



Veterinarians can diagnose **Endoparasites** through a variety of diagnostic methods, including:

- Coprology
- Stained tape strip (for helminths)
- Blood tests (protozoans)
- > PCR tests
- Antigen tests
- > Visible presence of endoparasites in faeces, anus, vomit, etc.
- Visible presence of tapeworm proglottids on coat, anus.

#### Ideally:

- > Physical examinations and coprology should take place as recommended by the vet in your pet's individual health plan;
- > Special preventive measures should be taken for puppies, kittens, pregnant and immunosuppressed animals;
- Vector-borne disease<sup>3</sup> testing should be performed periodically, especially in regions where pathogens are endemic or emerging. For example, dogs should be screened annually for heartworm disease in Southern European countries.

In reality, there is no "one-size-fits-all solution", every case is different. Accurate diagnosis very much relates to the region, the pet's lifestyle, clinical signs, suspected parasites, etc.

In some cases, the diagnosis can only be done at a late stage of infestation and may then include more health risks, than the preventive administration of parasite protection, so veterinarians can advise the best plan for each pet based on the resources available and local epidemiology.

More detailed information is provided in ESCCAP<sup>4</sup> guidelines and FECAVA<sup>5</sup> guidelines.



3: Vector borne diseases: According to EFSA, A vector is a living organism that transmits an infectious agent from an infected animal to a human or another animal. Vectors are frequently arthropods, such as mosquitoes, ticks, flies, fleas and lice. Diseases transmitted by vectors are called vector-borne diseases. Many vector-borne diseases are zoonotic diseases, i.e. diseases that can be transmitted directly or indirectly between animals and humans. Many vector-borne diseases are considered as emerging infectious diseases in the European Union.

4: The European Scientific Counsel for Companion Animal Parasites (ESCCAP) was formed in 2005. It is an independent, not for profit organisation, comprising a group of eminent veterinarians across Europe all with recognised expertise in the field of parasitology. ESCCAP is dedicated to providing access to clear and constructive information for veterinarians and pet owners with the aim of strengthening the animal-human bond. It works to provide the knowledge essential to help eradicate parasites in pets and the objective is to have a Europe where parasites are no longer a health issue for pets or humans.

5: Through its member associations, the Federation of European Companion Animal Veterinary Associations (FECAVA) represents more than 25,000 companion animal veterinarians in 39 European countries. FECAVA strives to improve the veterinary care of pets through professional development. It also provides a voice for companion animal issues at European level and works closely with other European veterinary organisations and stakeholders.

# SYMPTOMS AND TREATMENT

Depending on the parasite, symptoms of infestation can include scratching, irritated ears, shaking of the head, alopecia, rash, hair loss, irritated skin, skin allergies, brown wax inside the ears, anaemia, fever, paralysis, lameness.

ESCCAP guidelines detail some recognisable signs per parasite. Many signs are relevant to several parasites and highly dependent on the level of infestation.

In some cases, in addition to the treatment of the parasite infestation, treatment of the consequent secondary symptoms (e.g., secondary bacterial or fungal infection caused by fleas or ear mites) and any resulting disease may be needed. The veterinarian will evaluate the situation and, depending on factors such as severity of infection, the animal health status and the parasite and/or disease involved, may prescribe the appropriate treatment.

The veterinarian will choose licensed products that are relevant for the specific parasite and/or disease that an individual animal needs protection against.

### **Prevention and control products**

Parasite control substances come in many forms: oral (tablets, chewables), injectable, topical (spot-on solutions, collars, cutaneous sprays or solutions, shampoos).

Detailed information and advice on all veterinary prevention and control products available will initially be given by the veterinarian or authorised advisor (according to national legislation). Furthermore, information is available in the respective package leaflet or can be found online via medicinal products databases or via the product's e-leaflet.

There are very few vaccines available for parasite protection in the EU/EEA, so antiparasitic medicines remain the main therapeutic and preventive solution.

### The importance of using prevention and control products

It's essential to prevent diseases coming from parasites, not only to protect animal health, but also to protect human health and to preserve the human-animal bond.

Prevention and control of parasites is important because parasites:

- > may cause disease, accompanied by symptoms like pain and discomfort that negatively impact animal welfare
- > can be contagious not only within the same animal species but also different species, including people (zoonotic diseases)
- can transmit pathogens, such as bacteria, viruses, protozoa and helminths
- > can induce immunopathological responses
- > can cause diseases that are difficult to treat and can leave irreversible damage or even lead to death

### **Responsible Use of prevention and control products**

When and as advised in the individual parasite control plan previously made by the vet or an authorised advisor (according to national legislation), various products can be used to either prevent or control parasite infestations.

Here you can find a few examples taken from ESCAAP Guidelines:

Fleas	While flea infestations usually peak in summer and autumn, in areas where reinfestation with fleas is highly likely, such as warm conditions and multiple animal households, regular (year-round) prophylaxis using an approved product may be recommended.
Lice ≇∰	One treatment may be all that is necessary if the product advised has an efficacy beyond the egg-to-egg development time of lice. In some cases reapplication after 10 to 14 days is required to treat larvae hatching from the eggs.
Sandflies 涨	It is mainly advisable to minimise sandfly host interaction, e.g. not taking pets to leishmaniosis-endemic areas or keeping animals indoors after dusk in endemic areas, but a repellent may be recommended throughout the sandfly season to reduce the risk of Leishmania infantum infections.
Ticks 苍	Considering the risk level, animals should be checked regularly, in particular towards the end of the protection period to ensure that any visible ticks are removed and repeat treatment advised if appropriate. NB: efficacy duration may differ between tick species (consult product leaflet for information), hence the need for regular visual checks to verify if the treatment remains effective.
<b>Mites</b> 渋	Due to the need to kill all the mites during infestation and to prevent the recurrence of disease, systemic treatments ( via bloodstream) may be necessary.

## RECOMMENDATIONS FOR BEST PRACTICES

There is "no one-size-fits-all" solution to avoid parasite infestation.

EPRUMA partners recommend adhering to ESCCAP guidelines alongside regular veterinary visits.

- Responsible pet ownership includes choosing the most suitable parasite control: **Consult your vet** so he/she can provide personalised and individual advice and recommend the most suitable product for your specific pet's needs, based on their species, age, health status and parasitic prevention needs, but also based on your geographic location and associated risk factors.
- If you can't consult a vet, at least, **ensure that the parasite control product is licensed** for the species and age of the animal you are treating. Some products may be suitable for certain species but not suitable for others. Using the wrong product or the wrong mix of products can be ineffective and highly dangerous.
- Don't administer anything to a sick, pregnant or nursing animal without consulting your veterinarian, unless explicitly stated otherwise on the label.

## **ADMINISTERING PARASITE CONTROL**



Always read the leaflet: Carefully read all the information and instructions for use on the product leaflet, including target species, the active ingredients, recommended dosage, administration method, frequency of use and safety precautions. If you have any questions, please contact your veterinarian before administering.



**Check the expiry date:** Check the expiration date on the product label and do not use the product if it has expired. Expired products may not be effective and can be potentially harmful.



Follow the dosage: Use the correct dosage based on the animal's weight and age, as advised by the vet. Follow the recommended administration method (e.g., topical or oral) and frequency of use.



Take due care: When stated in the leaflet, take precautions to prevent the product from coming into contact with the animal's eyes, mouth, or broken skin. If contact occurs, make sure to follow the instructions provided and/or contact your veterinarian. The same precautions apply to the person(s) administering the medicine.



Adverse reactions: Monitor your pet for any adverse reactions after applying the product. If your pet shows any signs of discomfort, unusual behaviour or symptoms such as excessive drooling, vomiting, diarrhoea, or lethargy, contact your veterinarian immediately. Then make a pharmacovigilance declaration via the veterinarian, competent authority or directly via the product manufacturer.



**Ensure correct disposal:** These products should never be disposed of in the sink or toilet. Dispose of empty parasite control product containers according to the instructions in the product leaflet and/or local regulations. Some products may require special disposal methods.



**Ensure correct storage:** Store the product in its original packaging, as instructed (e.g., room temperature). Store it in a safe place, inaccessible to children and animals to prevent accidental ingestion.



Keep records: Maintain a record of when you administer parasite control treatments to ensure you do not miss any doses and to track any adverse reactions. (As above, inform your vet of any adverse reactions)



Schedule regular veterinary check-ups: Ensure regular veterinary check-ups to ensure you have the most recent and relevant recommendations for parasite control for your pet.

### Always use officially approved Veterinary Medicinal Products

**Approved products:** Animal health companies are required to comply with EU and/or national safety, quality and efficacy assessments for the animal, the user and the environment prior to receiving a marketing authorisation for placing a product on the market.

#### How to recognise an approved Veterinary Medicinal Product?

"Veterinary Medicinal Product" should be explicitly mentioned in the standard warning (i.e. The "Veterinary Medicinal Product" must be kept out of the sight and reach of children.) The labelling on the outer packaging must provide detailed information on the indication such as treatment/prevention of flea, tick and the target species (e.g. dog, cat), as approved by the authority. To be 100% sure, you can find all the officially approved Veterinary Medicines listed on the <u>EU's Union Product Database portal</u>.

**Pharmacovigilance:** Report any suspected adverse reactions to the treatment (including those listed on the leaflet) or lack of efficacy to your veterinarian, the competent authority or directly via the product manufacturer. After being placed on the market there is an official process to ensure the detection, assessment, understanding and prevention of adverse events or any other medicine-safety and efficacy issue. This ensures the continuous assessment of benefit/risk balance of the product.

# CONCLUSIONS

Responsible use of parasite protection and control products alongside other preventive measures is essential for safeguarding pet health and welfare.

Diseases, including zoonotic infections may persist due to inadequate or incorrect parasite control, underscoring the importance of prevention. To combat parasitic zoonoses effectively, an integrated, multidisciplinary One Health approach involving veterinary and medical scientists, policymakers, and responsible pet owners is crucial. Adhering to best practices and product leaflet advice helps ensure responsible use and positive outcomes for all.

Today in Europe, health challenges such as demodectic mange and echinococcus are far less common in companion animals compared to a few decades ago, largely thanks to innovation and responsible parasite protection and control.

Nevertheless, current changes in climate, with fewer sub-zero temperatures during winter, lead to epidemiological changes both in external parasites and vector borne diseases. For example, the Rhipicephalus tick, is expanding to the north of Europe and the same geo-expansion is observed for mosquitoes and sandflies from south to north and east. This is geographically expanding the risks of severe vector borne diseases like cardiac dirofilariosis (heartworm disease), leishmaniosis, and canine monocytic ehrlichiosis in Europe. Ensuring adequate parasite prevention and control as advised by the veterinarian is important to control these increasing risks.

By following these guidelines, you can ensure the responsible use of parasite control products and help protect your pets from harmful parasites. Remember, the veterinarian is the best resource for advising the right parasite control for each pet's individual needs.



References and extra resources





9-13 rue d'Idalie – box 5, 4th floor 1050 Brussels, Belgium

Email: info@epruma.eu

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