

Boehringer Ingelheim Canine Parasiticides
SATISFACTION GUARANTEE



Satisfaction Guaranteed.

Boehringer Ingelheim has a legacy of developing a range of safe and effective products that help protect pets from internal and external parasites. We create products to protect animals, help keep them healthy, and give veterinarians and pet owners peace of mind. We are proud to support our canine parasiticide portfolio with the **Canine Parasiticides SATISFACTION GUARANTEE**.



The Portfolio That Provides Trust, Safety, Efficacy, and Taste

HEARTGARD® Plus (ivermectin/pyrantel)

The only real-beef chew dogs prefer*¹ that prevents heartworm disease and protects against roundworms and hookworms. Safe for puppies 6 weeks of age and older with no minimum weight requirement.

NexGard® PLUS (afoxolaner, moxidectin, and pyrantel chewable tablets)

One-and-done monthly parasite protection against fleas, ticks, heartworm disease, and intestinal parasites. Safe for puppies at 8 weeks, weighing 4 lbs or more.

NexGard® (afoxolaner)

Powerful flea and tick protection labeled to prevent the infections that cause Lyme disease by killing black-legged ticks, but gentle enough to be safe for puppies 8 weeks and older, weighing 4 pounds or more.

PURCHASE REQUIREMENTS

The SATISFACTION GUARANTEE is available to any individual who has purchased NexGard PLUS chews, HEARTGARD Plus chews, or NexGard chews from a veterinary clinic or with a veterinarian's prescription and has a valid receipt or proof of purchase. Proof of prescription and purchase is required.

GET IN TOUCH

If you have questions regarding NexGard PLUS chews, HEARTGARD Plus chews, NexGard chews, or the Satisfaction Guarantee, please contact **Veterinary Technical Solutions: 1-888-637-4251**.

*For dogs demonstrating a preference, they preferred HEARTGARD Plus chews over the competition.
1. Data on file at Boehringer Ingelheim.

IMPORTANT SAFETY INFORMATION: NexGard PLUS chews are for use in dogs only. The most frequently reported adverse reactions reported in clinical trials were diarrhea, vomiting, lethargy, and itching. Use with caution in dogs with a history of seizures or neurologic disorders. Dogs should be tested for a heartworm infection prior to starting a heartworm disease preventive. For more information, see the full prescribing information or visit NexGardPLUS.com.

IMPORTANT SAFETY INFORMATION: HEARTGARD Plus chews are for use in dogs only. All dogs should be tested for heartworm infection before starting a preventive program. Following the use of HEARTGARD Plus, digestive and neurologic side effects have been reported. For more information, see the full prescribing information or visit www.HEARTGARD.com.

IMPORTANT SAFETY INFORMATION: NexGard chews are for use in dogs only. The most frequently reported adverse reactions include vomiting, itching, lethargy, diarrhea, and lack of appetite. The safe use of NexGard in pregnant, breeding, or lactating dogs has not been evaluated. Use with caution in dogs with a history of seizures or neurologic disorders. For more information, see the full prescribing information or visit NexGardForDogs.com.

HEARTWORM DISEASE

NexGard[®] PLUS
(afoxolaner, moxidectin, and
pyrantel chewable tablets)

Heartgard[®] PLUS
(ivermectin/pyrantel)

NexGard[®] PLUS (afoxolaner, moxidectin, and pyrantel chewable tablets) and HEARTGARD[®] Plus (ivermectin/pyrantel) are indicated for the prevention of heartworm disease caused by *Dirofilaria immitis*.

ELIGIBILITY

To qualify for coverage, 2 positive antigen tests, performed on samples from 2 separate blood collections and using 2 different antigen tests, are required.

LEVEL ONE

- Dogs must test heartworm antigen negative within 2 weeks of beginning NexGard PLUS chews or HEARTGARD Plus chews.
- The dog has received 12 doses of NexGard PLUS chews or HEARTGARD Plus chews in the 12 months prior to a positive antigen test for heartworms.
 - There can be no missed doses of NexGard PLUS chews or HEARTGARD Plus chews between the initial negative test and the positive antigen test.
- Dogs starting:
 - Between 6 weeks and 4 months of age for HEARTGARD Plus chews or between 8 weeks and 4 months of age for NexGard PLUS chews are covered immediately for protection against heartworm disease.
 - Between 4 months and 6 months of age will be covered following a negative antigen test 6 months after the first dose of NexGard PLUS chews or HEARTGARD Plus chews is administered.
 - Older than 6 months of age will be covered if 2 negative antigen tests are obtained (one prior to the first dose of an eligible product and one 6 months after the first dose is administered), and the dog was not previously positive for heartworms.

LEVEL TWO

Dogs infected with heartworms after a minimum of 9 months of continuous use of NexGard PLUS chews or HEARTGARD Plus chews in the prior 12 months and/or insufficient negative antigen testing records.

COVERAGE AND COMPENSATION

LEVEL ONE

For any qualifying patient, Boehringer Ingelheim will credit the clinic \$1000 to be used for veterinary services related to treatment. We will also provide a complimentary heartworm adulticide product from Boehringer Ingelheim and a 12-month supply of either NexGard PLUS chews or HEARTGARD Plus chews.

LEVEL TWO

We will provide a complimentary heartworm adulticide product from Boehringer Ingelheim and a 12-month supply of either NexGard PLUS chews or HEARTGARD Plus chews.

HOOKWORMS, ROUNDWORMS, WHIPWORMS, AND TAPEWORMS

NexGard[®] PLUS
(afoxolaner, moxidectin, and
pyrantel chewable tablets)

Heartgard[®] PLUS
(ivermectin/pyrantel)

NexGard[®] PLUS chews and HEARTGARD[®] Plus chews are indicated for the treatment and control of adult hookworm (*Ancylostoma caninum*, *Ancylostoma braziliense*, and *Uncinaria stenocephala*) and roundworm (*Toxocara canis* and *Toxascaris leonina*) infections. Neither product is effective in treating and/or controlling whipworms or tapeworms in dogs and puppies. However, to support our customers, infections with these parasites are also covered under this SATISFACTION GUARANTEE.

ELIGIBILITY

The dog has received a dose of NexGard PLUS chews or HEARTGARD Plus chews and within 30 days of administration has a positive fecal test result for the presence of roundworms, hookworms, whipworms, or tapeworm eggs. For tapeworm infection, a positive visual identification of proglottids may also be used.

COVERAGE AND COMPENSATION

We will reimburse the cost of the fecal test and treatment up to \$100.



NexGard® PLUS (afoxolaner, moxidectin, and pyrantel chewable tablets) and NexGard® (afoxolaner) kill adult fleas and are indicated for the treatment and prevention of flea infestations.

ELIGIBILITY

- Dog has received a dose of NexGard PLUS chews or NexGard chews for at least 3 consecutive months.
- All other pets in the home must be treated with an appropriate flea control product for at least 3 months prior to the report.

COVERAGE AND COMPENSATION

You may be eligible for one of the following:

- A refund of product purchase.
- A product replacement.
- A one-time professional in-home pest control inspection and treatment, if necessary, up to \$300.



NexGard PLUS chews and NexGard chews are indicated for the treatment and control of *Ixodes scapularis* (black-legged tick), *Rhipicephalus sanguineus* (brown dog tick), *Dermacentor variabilis* (American dog tick), and *Amblyomma americanum* (lone star tick) infestations for 1 month.

ELIGIBILITY

Dog has received a dose of NexGard PLUS chews or NexGard chews and is found to have a tick infestation within 30 days of product administration.

LYME DISEASE

- Only NexGard chews are indicated for the prevention of *Borrelia burgdorferi* infections as a direct result of killing *Ixodes scapularis* vector ticks.
- Dogs must test negative for Lyme infections within a month of beginning NexGard chews and negative tests annually thereafter.
 - There can be no missed doses of NexGard chews between the initial negative test and the positive Lyme antigen test.
- For dogs starting on preventive at ages:
 - Between 8 weeks and 4 months, negative test is recommended.
 - Older than 4 months, a negative test is required.

COVERAGE AND COMPENSATION

You may be eligible for one of the following:

- A refund (of product purchase).
- A product replacement.

LYME DISEASE

- Boehringer Ingelheim will reimburse veterinarian for additional testing and treatment with appropriate antibiotics if warranted.
- If the dog is showing clinical signs, Boehringer Ingelheim will support additional reasonable diagnostic and treatment charges up to \$5000.

LYME DISEASE + RECOMBITEK® LYME VACCINE

If the dog has received NexGard PLUS[†] chews or NexGard chews and has also been vaccinated with the RECOMBITEK® Lyme vaccine, additional support may be possible.

- RECOMBITEK Lyme vaccine with a history of proper vaccine series within 12 months preceding claim.
- Negative Lyme disease test within 1 month of the dog starting preventive and positive confirmatory test indicating exposure to Lyme.

LYME DISEASE + RECOMBITEK® LYME VACCINE

Boehringer Ingelheim will reimburse veterinarian for reasonable diagnostic and treatment charges for Lyme disease up to \$10,000.

[†]NexGard PLUS chews are not labeled for the prevention of Lyme disease.



NexGard PLUS chews and NexGard chews are soft, delicious, beef-flavored chews that make protecting your dog an easy, enjoyable experience to remember. HEARTGARD® Plus (ivermectin/pyrantel) is the only heartworm disease preventive available in a real-beef chew that dogs prefer.*¹

ELIGIBILITY

Dog does not accept the chew.

COVERAGE AND COMPENSATION

We will reimburse the cost of the purchased package.

*For dogs demonstrating a preference, they preferred HEARTGARD Plus chews over the competition.
1. Data on file at Boehringer Ingelheim.

GENERAL ELIGIBILITY REQUIREMENTS AND GUIDELINES

GENERAL ELIGIBILITY

- The guarantee is not retroactive. To qualify for any portion of the guarantee, reports must be received within 6 months of the incident in question. Please ensure that your veterinarian contacts the Veterinary Technical Solutions (VeTS) team to discuss support in advance of testing or treatment. Boehringer Ingelheim will not be responsible for any diagnostic or treatment-related costs that were made prior to contacting VeTS.
- An itemized receipt for the purchase of NexGard® (afoxolaner) or NexGard® PLUS (afoxolaner, moxidectin, and pyrantel chewable tablets) for the affected dog must be submitted to Boehringer Ingelheim. For the FLEA SATISFACTION GUARANTEE, itemized receipts for the purchase of flea control for all pets in the home are required. The receipt must show the place of purchase, the date of purchase, the product brand name, the amount of product purchased, and the purchase price. For the LYME SATISFACTION GUARANTEE, the affected dog's medical records will be required showing Lyme testing history and NexGard chews purchase history. For the LYME SATISFACTION GUARANTEE, the records required for the LYME SATISFACTION GUARANTEE as well as documentation showing administration of the RECOMBITEK® Lyme vaccine within the previous 12 months must be submitted.
- NexGard chews or NexGard PLUS chews must have been purchased from a veterinary clinic or with a written prescription via a valid veterinarian-client-patient relationship. Boehringer Ingelheim reserves the right to request that original receipts be submitted via fax, email, or mail before a guarantee claim will be processed.
- The guarantee claim can only be processed for the individual whose name appears on the receipt.
- All claims must be initiated within 6 months of the incident in question. After 6 months, the claim will become null and void.
- Reimbursement for portions of this guarantee is based on a set fee schedule and may not equal the amount charged to the client by the veterinary clinic.
- The guarantee is only valid for product labeled in the United States.
- Please allow 4-6 weeks for processing of refunds.
- Product that has been obtained free of charge is not eligible for the guarantee.
- Boehringer Ingelheim reserves the right to cancel or amend the guarantee program at any time.
- SATISFACTION GUARANTEE void where prohibited by law.
- Payment obligation by Boehringer Ingelheim shall be limited solely to that which is represented herein. Any and all other costs are expressly excluded.

FLEAS AND TICKS GUARANTEE GUIDELINES

- Because the flea life cycle can vary from 2 weeks to several months, it may take several monthly administrations of any flea control product to break the flea life cycle. Therefore you are required to use NexGard chews or NexGard PLUS chews for at least 3 consecutive months in the affected dog to be eligible.
- The guarantee is available for the most recent purchase of 3 or 6 doses. NexGard chews or NexGard PLUS chews must have been used consistently in the affected dog for the 3 months prior to the claim. You may choose to receive either one replacement package of the same NexGard chews

IMPORTANT SAFETY INFORMATION: NexGard PLUS chews are for use in dogs only. The most frequently reported adverse reactions reported in clinical trials were diarrhea, vomiting, lethargy, and itching. Use with caution in dogs with a history of seizures or neurologic disorders. Dogs should be tested for a heartworm infection prior to starting a heartworm disease preventive. For more information, see the full prescribing information or visit NexGardPLUS.com.

IMPORTANT SAFETY INFORMATION: HEARTGARD Plus chews are for use in dogs only. All dogs should be tested for heartworm infection before starting a preventive program. Following the use of HEARTGARD Plus, digestive and neurologic side effects have been reported. For more information, see the full prescribing information or visit www.HEARTGARD.com.

IMPORTANT SAFETY INFORMATION: NexGard chews are for use in dogs only. The most frequently reported adverse reactions include vomiting, itching, lethargy, diarrhea and lack of appetite. The safe use of NexGard in pregnant, breeding, or lactating dogs has not been evaluated. Use with caution in dogs with a history of seizures or neurologic disorders. For more information, see the full prescribing information or visit NexGardForDogs.com.

product, a refund for the purchase price, or an in-home inspection by a professional pest control specialist. Taxes are not reimbursable. In some instances, product replacement may not be an option.

- Should you choose the in-home inspection, treatment will be provided if deemed necessary by the pest control specialist. Boehringer Ingelheim will contact the pest control service and have them schedule a service date with you. Boehringer Ingelheim will cover the cost of the visit by paying the pest control service directly. You must allow the pest control specialist into the home if an inspection is desired. One free professional in-home inspection per household.

LYME SATISFACTION GUARANTEE GUIDELINES

- If your dog is found to be positive for *Borrelia burgdorferi* infection after consistent use of NexGard® (afoxolaner) (*B. burgdorferi* antibody seropositive for first time since last negative test), Boehringer Ingelheim will provide financial support to your veterinarian to conduct additional testing with either the Cornell Canine Lyme Multiplex or the IDEXX® Quantitative C6® Antibody test, as well as urinalysis and urine protein:creatinine ratio, if desired. Your veterinarian should contact VeTS at 1-888-637-4251 to make these arrangements in advance of the testing.
- The affected dog must have appropriate purchase history showing enough purchases of NexGard chews to have received the product consistently each month from the date of the negative test through the date of the claim. LYME SATISFACTION GUARANTEE cases are not eligible for product refund or replacement.
- While some diagnostic tests for Lyme infection can detect an infection as early as 3 weeks post-exposure, it can take up to 3 months for some currently available tests. For this reason, it is recommended (though not required for the guarantee) that dogs be tested for Lyme infection approximately 3 months after starting NexGard chews to ensure that the dog was not exposed prior to initiation of NexGard chews treatment.

INTESTINAL PARASITES GUARANTEE GUIDELINES

- Dogs housed in intensified population facilities of 6 dogs or more will not be covered under the intestinal parasite portion of this guarantee.

HEARTWORM GUARANTEE GUIDELINES

Dogs starting on HEARTGARD® Plus (ivermectin/pyrantel) or NexGard® PLUS (afoxolaner, moxidectin, and pyrantel chewable tablets):

- Between 8 weeks and 4 months of age: covered immediately for protection against heartworms.
- Between 4 and 6 months of age: covered following a negative antigen test 6 months after first dose.
- 6 months of age and older: covered if antigen tests performed prior to first dose and 6 months following first dose prove negative, and the dog was not previously positive for heartworms.
- 6 months of age or older when switching from another brand of heartworm preventive to HEARTGARD Plus chews: covered if antigen tests performed within 2 weeks prior to the first dose of HEARTGARD Plus chews and 6 months following the first dose of HEARTGARD Plus chews prove negative, and the dog was not previously positive for heartworms. Thereafter, antigen test must be performed annually.

NexGard[®] PLUS

(afoxolaner, moxidectin, and pyrantel chewable tablets)

For oral use in dogs only.

CAUTION: Federal law restricts this drug to use by or on the order of a licensed veterinarian.

Description:

NexGard[®] PLUS (afoxolaner, moxidectin, and pyrantel chewable tablets) is available in five sizes of beef-flavored, soft chewables for oral administration to dogs and puppies according to their weight. Each chewable is formulated to provide minimum doses of 1.14 mg/lb (2.5 mg/kg) afoxolaner, 5.45 mcg/lb (12 mcg/kg) moxidectin, and 2.27 mg/lb (5.0 mg/kg) pyrantel (as pamoate salt).

Afoxolaner is a member of the isoxazoline family of compounds. Its chemical name is 1-Naphthalene-carboxamide, 4-[5-[3-chloro-5-(trifluoromethyl)-phenyl]-4,5-dihydro-5-(trifluoromethyl)-3-isoxazolyl]-N-[2-oxo-2-[(2,2,2-trifluoroethyl)amino]ethyl].

Moxidectin is a semisynthetic macrocyclic lactone derived from the actinomycete *Streptomyces cyaneogriseus noncyanogenus*. The chemical name for moxidectin is [6R,23E,25S(E)]-5-O-Demethyl-28-deoxy-25-(1,3-dimethyl-1-butenyl)-6,28-epoxy-23-(methoxyimino) milbemycin B.

Pyrantel is a member of the tetrahydropyrimidine family of compounds. Its chemical name is (E)-1,4,5,6-Tetrahydro-1-methyl-2-[2-(2-thienyl)vinyl]pyrimidine 4,4'-methylenebis[3-hydroxy-2-naphthoate](1:1).

Indications:

NexGard[®] PLUS is indicated for the prevention of heartworm disease caused by *Dirofilaria immitis*. NexGard[®] PLUS is indicated for the treatment and control of adult hookworm (*Ancylostoma caninum*, *Ancylostoma braziliense*, and *Uncinaria stenocephala*) and roundworm (*Toxocara canis* and *Toxascaris leonina*) infections. NexGard[®] PLUS kills adult fleas and is indicated for the treatment and prevention of flea infestations (*Ctenocephalides felis*) and the treatment and control of *Ixodes scapularis* (black-legged tick), *Rhipicephalus sanguineus* (brown dog tick), *Dermacentor variabilis* (American dog tick), and *Amblyomma americanum* (lone star tick) infestations for one month in dogs and puppies eight weeks of age and older, weighing four pounds of body weight or greater.

Dosage and Administration:

NexGard[®] PLUS is given orally once a month at the minimum dosage of 1.14 mg/lb (2.5 mg/kg) afoxolaner, 5.45 mcg/lb (12 mcg/kg) moxidectin, and 2.27 mg/lb (5.0 mg/kg) pyrantel (as pamoate salt).

For heartworm disease prevention, give once monthly for at least six months after last exposure to mosquitoes (see **Effectiveness**).

Dosing Schedule:

Body Weight (lbs.)	Afoxolaner Per Chewable (mg)	Moxidectin Per Chewable (mcg)	Pyrantel* Per Chewable (mg)	Chewables Administered
4 to 8 lbs.	9.375	45	18.75	One
8.1 to 17 lbs.	18.75	90	37.5	One
17.1 to 33 lbs.	37.5	180	75	One
33.1 to 66 lbs.	75	360	150	One
66.1 to 132 lbs.	150	720	300	One
Over 132 lbs.	Administer the appropriate combination of chewables			

*As pamoate salt.

NexGard[®] PLUS can be administered with or without food. Care should be taken to ensure that the dog consumes the complete dose and that part of the dose is not lost or refused. If a dose is missed, administer NexGard[®] PLUS and resume a monthly dosing schedule.

Heartworm Prevention:

NexGard[®] PLUS should be administered at monthly intervals year-round or, at a minimum, administration should start within one month of the dog's first seasonal exposure to mosquitoes and should continue at monthly intervals until at least six months after the dog's last exposure (see **Effectiveness**). When replacing another monthly heartworm preventive product, the first dose of NexGard[®] PLUS should be given within a month of the last dose of the former medication.

Flea Treatment and Prevention:

NexGard[®] PLUS should be administered year-round at monthly intervals or started at least one month before fleas become active. To minimize the likelihood of flea reinfestation, it is important to treat all animals within a household with an approved flea control product.

Tick Treatment and Control:

NexGard[®] PLUS should be administered year-round at monthly intervals or started at least one month before ticks become active.

Intestinal Nematode Treatment and Control:

NexGard[®] PLUS treats and controls adult hookworms (*Ancylostoma caninum*, *Ancylostoma braziliense*, and *Uncinaria stenocephala*) and roundworms (*Toxocara canis* and *Toxascaris leonina*). For the treatment of adult hookworm and roundworm infections, NexGard[®] PLUS should be administered as a single dose. Monthly use of NexGard[®] PLUS will control any subsequent infections. Dogs may be exposed to and can become infected with hookworms and roundworms throughout the year, regardless of season or climate.

Contraindications:

There are no known contraindications for the use of NexGard[®] PLUS.

Warnings:

Not for use in humans. Keep this and all drugs out of the reach of children. In case of accidental ingestion, contact a physician for treatment advice.

Keep NexGard[®] PLUS in a secure location out of the reach of dogs, cats, and other animals to prevent accidental ingestion or overdose.

Precautions:

Afoxolaner, one of the ingredients in NexGard[®] PLUS, is a member of the isoxazoline class. This class has been associated with neurologic adverse reactions including tremors, ataxia, and seizures. Seizures have been reported in dogs receiving isoxazoline class drugs, even in dogs without a history of seizures. Use with caution in dogs with a history of seizures or neurologic disorders.

Treatment with fewer than six monthly doses after the last exposure to mosquitoes has not been evaluated and may not provide complete heartworm prevention.

Prior to administration of NexGard[®] PLUS, dogs should be tested for existing heartworm infection. At the discretion of the veterinarian, infected dogs should be treated with an adulticide to remove adult heartworms. NexGard[®] PLUS is not effective against adult *D. immitis*.

The safe use of NexGard[®] PLUS in breeding, pregnant, or lactating dogs has not been evaluated.

Adverse Reactions:

In a field safety and effectiveness study, NexGard[®] PLUS was administered to dogs for the prevention of heartworm disease. The study included a total of 272 dogs (134 administered NexGard[®] PLUS and 138 administered active control) treated once monthly for 11 treatments. Over the 330-day study period, all observations of potential adverse reactions were recorded. The most frequent reactions reported in the NexGard[®] PLUS group are presented in the following table.

Table 1: Dogs With Adverse Reactions.

Clinical Sign	NexGard [®] PLUS n = 134 Number (Percentage)	Active Control n = 138 Number (Percentage)
Diarrhea	9 (6.7%)	7 (5.1%)
Vomiting	6 (4.5%)	7 (5.1%)
Lethargy	3 (2.2%)	5 (3.6%)
Itching	3 (2.2%)	3 (2.2%)
Dermatitis	2 (1.5%)	1 (0.7%)
Anorexia	1 (0.7%)	4 (2.9%)
Muscle tremor	1 (0.7%)	1 (0.7%)

One dog in the NexGard[®] PLUS group was reported to exhibit muscle tremors along with nausea and depression for one day after the Day 0 treatment. The dog remained in the study and muscle tremors were not reported after any subsequent treatments.

Contact Information:

For a copy of the Safety Data Sheet (SDS) or to report suspected adverse drug events, contact Boehringer Ingelheim Animal Health USA Inc. at 1-888-637-4251 or www.nexgardforpets.com.

For additional information about adverse drug experience reporting for animal drugs, contact FDA at 1-888-FDA-VETS or www.fda.gov/reportanimalae.

Clinical Pharmacology:

Mode of Action:

NexGard[®] PLUS (afoxolaner, moxidectin, and pyrantel chewable tablets) contains the three active pharmaceutical ingredients afoxolaner, moxidectin, and pyrantel (as pamoate salt). Afoxolaner is a member of the isoxazoline family, shown to bind at a binding site to inhibit insect and acarine ligand-gated chloride channels, in particular those gated by the neurotransmitter gamma-aminobutyric acid (GABA), thereby blocking pre- and postsynaptic transfer of chloride ions across cell membranes. Prolonged afoxolaner-induced hyperexcitability results in uncontrolled activity of the central nervous system and death of insects and acarines. The selective toxicity of afoxolaner between insects and acarines and mammals may be inferred by the differential sensitivity of the insects and acarines' GABA receptors versus mammalian GABA receptors.

Moxidectin is an endectocide in the macrocyclic lactone class. Moxidectin acts by interfering with chloride channel-mediated neurotransmission in susceptible parasites, which results in paralysis and death of the parasite.

Pyrantel is a nematocide belonging to the tetrahydropyrimidine class. Pyrantel acts as a depolarizing, neuromuscular-blocking agent in susceptible parasites, causing paralysis and death or expulsion of the parasite.

Pharmacokinetics:

Following a single oral administration of a near-final formulation of NexGard[®] PLUS (at mean doses of 3.9 mg/kg afoxolaner, 18.8 mcg/kg moxidectin, and 7.8 mg/kg pyrantel pamoate) in fed and fasted Beagle dogs (10 to 21 months of age), afoxolaner and moxidectin were more rapidly absorbed in the fasted state with a time to maximum concentration (T_{max}) of 2 to 3 hours.

The afoxolaner mean maximum plasma concentrations (C_{max}) in the fed and fasted states were 1610 and 2200 ng/mL (CV=33 and 16%) and the moxidectin mean C_{max} values were 11.1 and 15.5 ng/mL (CV=39 and 24%), respectively. The area under the curve (AUC) for afoxolaner and moxidectin were similar between fed and fasted states. Post-dose pyrantel plasma concentrations were quantifiable out to 24 hours.

Following six oral administrations of NexGard[®] PLUS at 1, 3, and 5X the maximum exposure dose of 5 mg/kg, 24 mcg/kg, and 10 mg/kg afoxolaner, moxidectin, and pyrantel pamoate, respectively, every 28 days in 8-week-old Beagle dogs, afoxolaner and moxidectin T_{max} ranged from 2 to 6 hours. The observed mean C_{max} and AUC at steady state in the 1X dose group were 2230 ng/mL and 19000 days*ng/mL for afoxolaner and 14.8 ng/mL and 55.2 days*ng/mL for moxidectin, respectively. Based on mean C_{min}, afoxolaner and moxidectin accumulated by less than 4-fold at steady state. Afoxolaner and moxidectin exposure increased in a dose proportional manner between the 1X and 3X dose groups but was less than dose proportional in the 5X dose group.

Pyrantel pamoate is poorly absorbed into systemic circulation. Pyrantel pamoate is intended to remain in the gastrointestinal tract to allow effective concentrations to be delivered to gastrointestinal nematodes.

Effectiveness:

Heartworm Prevention:

In two well-controlled laboratory studies, NexGard[®] PLUS was 100% effective against induced *D. immitis* infections when administered for six consecutive months.

In a well-controlled US field study consisting of 120 dogs administered NexGard[®] PLUS and 124 administered an active control, no dogs treated with NexGard[®] PLUS tested positive for heartworm disease. All dogs treated with NexGard[®] PLUS were negative for *D. immitis* antigen and blood microfilariae at study completion on Day 330.

Flea Treatment and Prevention:

In a well-controlled laboratory study, NexGard[®] PLUS demonstrated ≥99.8% effectiveness against adult fleas 24 hours after weekly infestations for one month.

In a separate well-controlled laboratory study, afoxolaner alone began to kill fleas four hours after initial administration and demonstrated >99% effectiveness at eight hours.

In an additional well-controlled laboratory study, afoxolaner alone demonstrated 100% effectiveness against adult fleas 24 hours post-infestation for 35 days and was ≥93% effective at 12 hours post-infestation through Day 21 and on Day 35. On Day 28, afoxolaner alone was 81.1% effective 12 hours post-infestation. Dogs in both the afoxolaner-treated and control groups that were infested with fleas on Day -1 generated flea eggs at 12 and 24 hours post-treatment (0-11 eggs and 1-17 eggs in the afoxolaner-treated dogs, and 4-90 eggs and 0-118 eggs in the control dogs, at 12 and 24 hours, respectively). At subsequent evaluations post-infestation, fleas from dogs in the afoxolaner-treated group were essentially unable to produce any eggs (0-1 eggs), while fleas from dogs in the control group continued to produce eggs (1-141 eggs).

In a 90-day US field study conducted in households with existing flea infestations of varying severity, the effectiveness of afoxolaner alone against fleas on the Day 30, 60, and 90 visits compared with baseline was 98.0%, 99.7%, and 99.9%, respectively.

Collectively, the data from the four studies (three laboratory and one field) demonstrate that NexGard[®] PLUS kills fleas before they can lay eggs, thus preventing subsequent flea infestations after the start of treatment of existing flea infestations.

Tick Treatment and Control:

In well-controlled laboratory studies, afoxolaner alone demonstrated >97% effectiveness against *Dermacentor variabilis*, >94% effectiveness against *Ixodes scapularis*, and >93% effectiveness against *Rhipicephalus sanguineus*, 48 hours post-infestation, for one month. At 72 hours post-infestation, NexGard[®] PLUS demonstrated ≥97% effectiveness against *Amblyomma americanum* for one month.

Intestinal Nematode Treatment and Control:

Elimination of adult roundworms (*Toxocara canis* and *Toxascaris leonina*) and hookworms (*Ancylostoma caninum*, *Ancylostoma braziliense*, and *Uncinaria stenocephala*) was demonstrated in well-controlled laboratory studies.

Target Animal Safety:

Margin of Safety:

NexGard[®] PLUS was administered orally at 1, 3, and 5X the maximum exposure doses at approximately 28-day intervals for six treatments to 8-week-old Beagle puppies. Dogs in the control group were sham-dosed. There were no clinically relevant, treatment-related effects on body weights, food consumption, clinical pathology (hematology, coagulation, serum chemistry, and urinalysis), gross pathology, histopathology, organ weights, or ophthalmic examinations. Mild, self-limiting diarrhea (with and without blood) was possibly related to treatment, as there were more incidences in the NexGard[®] PLUS groups than the control group throughout the study, including within 48 hours after treatment.

Avermectin-Sensitive Collie Safety:

NexGard[®] PLUS was administered orally at 1, 3, and 5X the maximum label dose to MDR1-deficient Collies once on Day 0, with a second administration to the 1X group on Day 28. Dogs in the control group were sham-dosed on Days 0 and 28. No clinical signs of avermectin toxicity were noted in any dog at any time during the study. Vomiting was observed in some dogs in the 3X and 5X groups and resolved without treatment. Diarrhea, with or without blood, was observed in some dogs in all of the NexGard[®] PLUS groups and resolved without treatment.

Heartworm-Positive Safety:

NexGard[®] PLUS was administered orally at 1X and 3X the maximum exposure doses at approximately 28-day intervals for three treatments to Beagle dogs with adult heartworm infections and circulating microfilariae. Dogs in the control group were sham-dosed. Diarrhea was observed in one dog in the 1X group and in three dogs in the 3X group, and vomiting was observed in two dogs in the 3X group. No signs of avermectin toxicity were observed at any time during the study. There were no clinical signs associated with death of the microfilariae observed in any of the dogs.

Field Safety:

In a well-controlled field study, NexGard[®] PLUS was used concurrently with other medications such as vaccines, antibiotics, non-steroidal anti-inflammatory drugs (NSAIDs), anesthetics, sedatives, analgesics, steroids, anthelmintics, antiemetics, and antipruritics. No adverse reactions were associated with the concurrent use of NexGard[®] PLUS and other medications.

How Supplied:

NexGard[®] PLUS is available in five strengths of beef-flavored soft chewables formulated according to the weight of the dog (see **Dosage and Administration**). Each chewable size is available in color-coded packages of 1, 3, or 6 chewables.

Storage Information:

Store in original package at or below 30°C (86°F) with excursions permitted up to 40°C (104°F).

Approved by FDA under NADA # 141-554

Marketed by: Boehringer Ingelheim Animal Health USA Inc., Duluth, GA 30096

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Rev. 07/2022



Heartgard[®] PLUS

(ivermectin/pyrantel)

CHEWABLES

CAUTION: Federal law restricts this drug to use by or on the order of a licensed veterinarian.

INDICATIONS: For use in dogs to prevent canine heartworm disease by eliminating the tissue stage of heartworm larvae (*Dirofilaria immitis*) for a month (30 days) after infection and for the treatment and control of roundworms (*Toxocara canis*, *Toxascaris leonina*) and hookworms (*Ancylostoma caninum*, *Uncinaria stenocephala*, *Ancylostoma braziliense*).

DOSAGE: HEARTGARD[®] Plus (ivermectin/pyrantel) should be administered orally at monthly intervals at the recommended minimum dose level of 6 mcg of ivermectin per kilogram (2.72 mcg/lb) and 5 mg of pyrantel (as pamoate salt) per kg (2.27 mg/lb) of body weight. The recommended dosing schedule for prevention of canine heartworm disease and for the treatment and control of roundworms and hookworms is as follows:

Dog Weight	Cheewables Per Month	Ivermectin Content	Pyrantel Content	Color Coding On Foil Backing and Carton
0 to 25 lbs	1	68 mcg	57 mg	Blue
26 to 50 lbs	1	136 mcg	114 mg	Green
51 to 100 lbs	1	272 mcg	227 mg	Brown

HEARTGARD[®] Plus is recommended for dogs 6 weeks of age and older. For dogs over 100 lbs use the appropriate combination of these chewables.

ADMINISTRATION: Remove only one chewable at a time from the foil-backed blister card. Return the card with the remaining chewables to its box to protect the product from light. Because most dogs find HEARTGARD[®] Plus palatable, the product can be offered to the dog by hand. Alternatively, it may be added intact to a small amount of dog food. The chewable should be administered in a manner that encourages the dog to chew, rather than to swallow without chewing. Chewables may be broken into pieces and fed to dogs that normally swallow treats whole.

Care should be taken that the dog consumes the complete dose, and treated animals should be observed for a few minutes after administration to ensure that part of the dose is not lost or rejected. If it is suspected that any of the dose has been lost, redosing is recommended.

HEARTGARD[®] Plus should be given at monthly intervals during the period of the year when mosquitoes (vectors), potentially carrying infective heartworm larvae, are active. The initial dose must be given within a month (30 days) after the dog's first exposure to mosquitoes. The final dose must be given within a month (30 days) after the dog's last exposure to mosquitoes.

When replacing another heartworm preventive product in a heartworm disease preventive program, the first dose of HEARTGARD[®] Plus must be given within a month (30 days) of the last dose of the former medication.

If the interval between doses exceeds a month (30 days), the efficacy of ivermectin can be reduced. Therefore, for optimal performance, the chewable must be given once a month on or about the same day of the month. If treatment is delayed, whether by a few days or many, immediate treatment with HEARTGARD[®] Plus and resumption of the recommended dosing regimen minimizes the opportunity for the development of adult heartworms.

Monthly treatment with HEARTGARD[®] Plus also provides effective treatment and control of roundworms (*T. canis*, *T. leonina*) and hookworms (*A. caninum*, *U. stenocephala*, *A. braziliense*). Clients should be advised of measures to be taken to prevent reinfection with intestinal parasites.

EFFICACY: HEARTGARD[®] Plus Chewables, given orally using the recommended dose and regimen, are effective against the tissue larval stage of *D. immitis* for a month (30 days) after infection and, as a result, prevent the development of the adult stage. HEARTGARD[®] Plus Chewables are also effective against canine roundworms (*T. canis*, *T. leonina*) and hookworms (*A. caninum*, *U. stenocephala*, *A. braziliense*).

ACCEPTABILITY: In acceptability and field trials, HEARTGARD[®] Plus was shown to be an acceptable oral dosage form that was consumed at first offering by the majority of dogs.

PRECAUTIONS: All dogs should be tested for existing heartworm infection before starting treatment with HEARTGARD[®] Plus which is not effective against adult *D. immitis*. Infected dogs must be treated to remove adult heartworms and microfilariae before initiating a program with HEARTGARD[®] Plus.

While some microfilariae may be killed by the ivermectin in HEARTGARD[®] Plus at the recommended dose level, HEARTGARD[®] Plus is not effective for microfilariae clearance. A mild hypersensitivity-type reaction, presumably due to dead or dying microfilariae and particularly involving a transient diarrhea, has been observed in clinical trials with ivermectin alone after treatment of some dogs that have circulating microfilariae.

Keep this and all drugs out of the reach of children.

In case of ingestion by humans, clients should be advised to contact a physician immediately. Physicians may contact a Poison Control Center for advice concerning cases of ingestion by humans.

Store between 68°F - 77°F (20° - 25°C). Excursions between 59°F - 86°F (15° - 30°C) are permitted. Protect product from light.

ADVERSE REACTIONS: In clinical field trials with HEARTGARD[®] Plus, vomiting or diarrhea within 24 hours of dosing was rarely observed (1.1% of administered doses). The following adverse reactions have been reported following the use of HEARTGARD[®]: depression/lethargy, vomiting, anorexia, diarrhea, mydriasis, ataxia, staggering, convulsions and hypersalivation.

To report suspected adverse drug events, for technical assistance, or to obtain a copy of the Safety Data Sheet (SDS), contact Boehringer Ingelheim Animal Health USA Inc. at 1-888-637-4251. For additional information about adverse drug experience reporting for animal drugs, contact FDA at 1-888-FDA-VETS, or www.fda.gov/reportanimalae.

SAFETY: HEARTGARD[®] Plus has been shown to be bioequivalent to HEARTGARD[®], with respect to the bioavailability of ivermectin. The dose regimens of HEARTGARD[®] Plus and HEARTGARD[®] are the same with regard to ivermectin (6 mcg/kg). Studies with ivermectin indicate that certain dogs of the Collie breed are more sensitive to the effects of ivermectin administered at elevated dose levels (more than 16 times the target use level) than dogs of other breeds. At elevated doses, sensitive dogs showed adverse reactions which included mydriasis, depression, ataxia, tremors, drooling, paresis, recumbency, excitability, stupor, coma and death. HEARTGARD[®] demonstrated no signs of toxicity at 10 times the recommended dose (60 mcg/kg) in sensitive Collies. Results of these trials and bioequivalency studies, support the safety of HEARTGARD[®] products in dogs, including Collies, when used as recommended.

HEARTGARD[®] Plus has shown a wide margin of safety at the recommended dose level in dogs, including pregnant or breeding bitches, stud dogs and puppies aged 6 or more weeks. In clinical trials, many commonly used flea collars, dips, shampoos, anthelmintics, antibiotics, vaccines and steroid preparations have been administered with HEARTGARD[®] Plus in a heartworm disease preventive program.

In one trial, where some pups had parvovirus, there was a marginal reduction in efficacy against intestinal nematodes, possibly due to a change in intestinal transit time.

HOW SUPPLIED: HEARTGARD[®] Plus is available in three dosage strengths (See DOSAGE section) for dogs of different weights. Each strength comes in convenient cartons of 1, 6 and 12 chewables.

Marketed by:
Boehringer Ingelheim Animal Health USA Inc.
Duluth, GA 30096

Approved by FDA under NADA # 140-971

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NexGard® (afoxolaner) Chewables

CAUTION: Federal (USA) law restricts this drug to use by or on the order of a licensed veterinarian.

Description:

NexGard® (afoxolaner) is available in four sizes of beef-flavored, soft chewables for oral administration to dogs and puppies according to their weight. Each chewable is formulated to provide a minimum afoxolaner dosage of 1.14 mg/lb (2.5 mg/kg). Afoxolaner has the chemical composition 1-Naphthalenecarboxamide, 4-[5-[3-chloro-5-(trifluoromethyl)-phenyl]-4,5-dihydro-5-(trifluoromethyl)-3-isoxazolyl]-N-[2-oxo-2-[(2,2,2-trifluoroethyl)amino]ethyl].

Indications:

NexGard kills adult fleas and is indicated for the treatment and prevention of flea infestations (*Ctenocephalides felis*), and the treatment and control of Black-legged tick (*Ixodes scapularis*), American Dog tick (*Dermacentor variabilis*), Lone Star tick (*Amblyomma americanum*), and Brown dog tick (*Rhipicephalus sanguineus*) infestations in dogs and puppies 8 weeks of age and older, weighing 4 pounds of body weight or greater, for one month. NexGard is indicated for the prevention of *Borrelia burgdorferi* infections as a direct result of killing *Ixodes scapularis* vector ticks.

Dosage and Administration:

NexGard is given orally once a month, at the minimum dosage of 1.14 mg/lb (2.5 mg/kg).

Dosing Schedule:

Body Weight	Afoxolaner Per Chewable (mg)	Chewables Administered
4.0 to 10.0 lbs.	11.3	One
10.1 to 24.0 lbs.	28.3	One
24.1 to 60.0 lbs.	68	One
60.1 to 121.0 lbs.	136	One
Over 121.0 lbs.	Administer the appropriate combination of chewables	

NexGard can be administered with or without food. Care should be taken that the dog consumes the complete dose, and treated animals should be observed for a few minutes to ensure that part of the dose is not lost or refused. If it is suspected that any of the dose has been lost or if vomiting occurs within two hours of administration, redose with another full dose. If a dose is missed, administer NexGard and resume a monthly dosing schedule.

Flea Treatment and Prevention:

Treatment with NexGard may begin at any time of the year. In areas where fleas are common year-round, monthly treatment with NexGard should continue the entire year without interruption.

To minimize the likelihood of flea reinfestation, it is important to treat all animals within a household with an approved flea control product.

Tick Treatment and Control:

Treatment with NexGard may begin at any time of the year (see **Effectiveness**).

Contraindications:

There are no known contraindications for the use of NexGard.

Warnings:

Not for use in humans. Keep this and all drugs out of the reach of children. In case of accidental ingestion, contact a physician immediately.

Keep NexGard in a secure location out of reach of dogs, cats, and other animals to prevent accidental ingestion or overdose.

Precautions:

Afoxolaner is a member of the isoxazoline class. This class has been associated with neurologic adverse reactions including tremors, ataxia, and seizures. Seizures have been reported in dogs receiving isoxazoline class drugs, even in dogs without a history of seizures. Use with caution in dogs with a history of seizures or neurologic disorders.

The safe use of NexGard in breeding, pregnant or lactating dogs has not been evaluated.

Adverse Reactions:

In a well-controlled US field study, which included a total of 333 households and 615 treated dogs (415 administered afoxolaner; 200 administered active control), no serious adverse reactions were observed with NexGard. Over the 90-day study period, all observations of potential adverse reactions were recorded. The most frequent reactions reported at an incidence of >1% within any of the three months of observations are presented in the following table. The most frequently reported adverse reaction was vomiting. The occurrence of vomiting was generally self-limiting and of short duration and tended to decrease with subsequent doses in both groups. Five treated dogs experienced anorexia during the study, and two of those dogs experienced anorexia with the first dose but not subsequent doses.

Table 1: Dogs With Adverse Reactions.

	Treatment Group			
	Afoxolaner		Oral active control	
	N ¹	% (n=415)	N ²	% (n=200)
Vomiting (with and without blood)	17	4.1	25	12.5
Dry/Flaky Skin	13	3.1	2	1.0
Diarrhea (with and without blood)	13	3.1	7	3.5
Lethargy	7	1.7	4	2.0
Anorexia	5	1.2	9	4.5

¹ Number of dogs in the afoxolaner treatment group with the identified abnormality.

² Number of dogs in the control group with the identified abnormality.

In the US field study, one dog with a history of seizures experienced a seizure on the same day after receiving the first dose and on the same day after receiving the second dose of NexGard. This dog experienced a third seizure one week after receiving the third dose. The dog remained enrolled and completed the study. Another dog with a history of seizures had a seizure 19 days

after the third dose of NexGard. The dog remained enrolled and completed the study. A third dog with a history of seizures received NexGard and experienced no seizures throughout the study.

Post-Approval Experience (July 2018):

The following adverse events are based on post-approval adverse drug experience reporting. Not all adverse events are reported to FDA/CVM. It is not always possible to reliably estimate the adverse event frequency or establish a causal relationship to product exposure using these data.

The following adverse events reported for dogs are listed in decreasing order of reporting frequency for NexGard:

Vomiting, pruritus, lethargy, diarrhea (with and without blood), anorexia, seizure, hyperactivity/restlessness, panting, erythema, ataxia, dermatitis (including rash, papules), allergic reactions (including hives, swelling), and tremors.

Contact Information:

For a copy of the Safety Data Sheet (SDS) or to report suspected adverse drug events, contact Boehringer Ingelheim Animal Health USA Inc. at 1-888-637-4251 or www.nexgardfordogs.com.

For additional information about adverse drug experience reporting for animal drugs, contact FDA at 1-888-FDA-VETS or www.fda.gov/reportanimalae.

Mode of Action:

Afoxolaner is a member of the isoxazoline family, shown to bind at a binding site to inhibit insect and acarine ligand-gated chloride channels, in particular those gated by the neurotransmitter gamma-aminobutyric acid (GABA), thereby blocking pre- and post-synaptic transfer of chloride ions across cell membranes. Prolonged afoxolaner-induced hyperexcitation results in uncontrolled activity of the central nervous system and death of insects and acarines. The selective toxicity of afoxolaner between insects and acarines and mammals may be inferred by the differential sensitivity of the insects and acarines' GABA receptors versus mammalian GABA receptors.

Effectiveness:

In a well-controlled laboratory study, NexGard began to kill fleas four hours after initial administration and demonstrated >99% effectiveness at eight hours. In a separate well-controlled laboratory study, NexGard demonstrated 100% effectiveness against adult fleas 24 hours post-infestation for 35 days, and was >93% effective at 12 hours post-infestation through Day 21, and on Day 35. On Day 28, NexGard was 81.1% effective 12 hours post-infestation. Dogs in both the treated and control groups that were infested with fleas on Day -1 generated flea eggs at 12- and 24-hours post-treatment (0-11 eggs and 1-17 eggs in the NexGard treated dogs, and 4-90 eggs and 0-118 eggs in the control dogs, at 12- and 24-hours, respectively). At subsequent evaluations post-infestation, fleas from dogs in the treated group were essentially unable to produce any eggs (0-1 eggs) while fleas from dogs in the control group continued to produce eggs (1-141 eggs).

In a 90-day US field study conducted in households with existing flea infestations of varying severity, the effectiveness of NexGard against fleas on the Day 30, 60 and 90 visits compared with baseline was 98.0%, 99.7%, and 99.9%, respectively.

Collectively, the data from the three studies (two laboratory and one field) demonstrate that NexGard kills fleas before they can lay eggs, thus preventing subsequent flea infestations after the start of treatment of existing flea infestations.

In well-controlled laboratory studies, NexGard demonstrated >97% effectiveness against *Dermacentor variabilis*, >94% effectiveness against *Ixodes scapularis*, and >93% effectiveness against *Rhipicephalus sanguineus*, 48 hours post-infestation for 30 days. At 72 hours post-infestation, NexGard demonstrated >97% effectiveness against *Amblyomma americanum* for 30 days. In two separate, well-controlled laboratory studies, NexGard was effective at preventing *Borrelia burgdorferi* infections after dogs were infested with *Ixodes scapularis* vector ticks 28 days post-treatment.

Animal Safety:

In a margin of safety study, NexGard was administered orally to 8 to 9-week-old Beagle puppies at 1, 3, and 5 times the maximum exposure dose (6.3 mg/kg) for three treatments every 28 days, followed by three treatments every 14 days, for a total of six treatments. Dogs in the control group were sham-dosed. There were no clinically-relevant effects related to treatment on physical examination, body weight, food consumption, clinical pathology (hematology, clinical chemistries, or coagulation tests), gross pathology, histopathology or organ weights. Vomiting occurred throughout the study, with a similar incidence in the treated and control groups, including one dog in the 5x group that vomited four hours after treatment.

In a well-controlled field study, NexGard was used concomitantly with other medications, such as vaccines, anthelmintics, antibiotics (including topicals), steroids, NSAIDs, anesthetics, and antihistamines. No adverse reactions were observed from the concomitant use of NexGard with other medications.

Storage Information:

Store at or below 30°C (86°F) with excursions permitted up to 40°C (104°F).

How Supplied:

NexGard is available in four sizes of beef-flavored soft chewables: 11.3, 28.3, 68 or 136 mg afoxolaner. Each chewable size is available in color-coded packages of 1, 3 or 6 beef-flavored chewables.

Approved by FDA under NADA # 141-406

Marketed by: Frontline Vet Labs™, a Division of Boehringer Ingelheim Animal Health USA Inc. Duluth, GA 30096

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