# BREAKTHROUGH MITE CONTROL

Exzolt™
(fluralaner oral solution)

PRODUCT DETAILER

MERCK
Animal Health

# BREAKTHROUGH MITE CONTROL

Exzolt™, new from Merck Animal Health, provides comprehensive management of northern fowl mites in chickens. Exzolt is delivered through the drinking water—reducing stress caused by conventional chemical sprays and minimizing the potential of chemical exposure to human workers. In two convenient administrations, Exzolt offers fast and nearly complete elimination of mite populations.

## KEY USES

- Mite infestations in laying hens and replacement chickens
- In situations with mite strains resistant to classical acaricides
- To improve overall animal health and welfare

## KEY PERFORMANCE BENEFITS

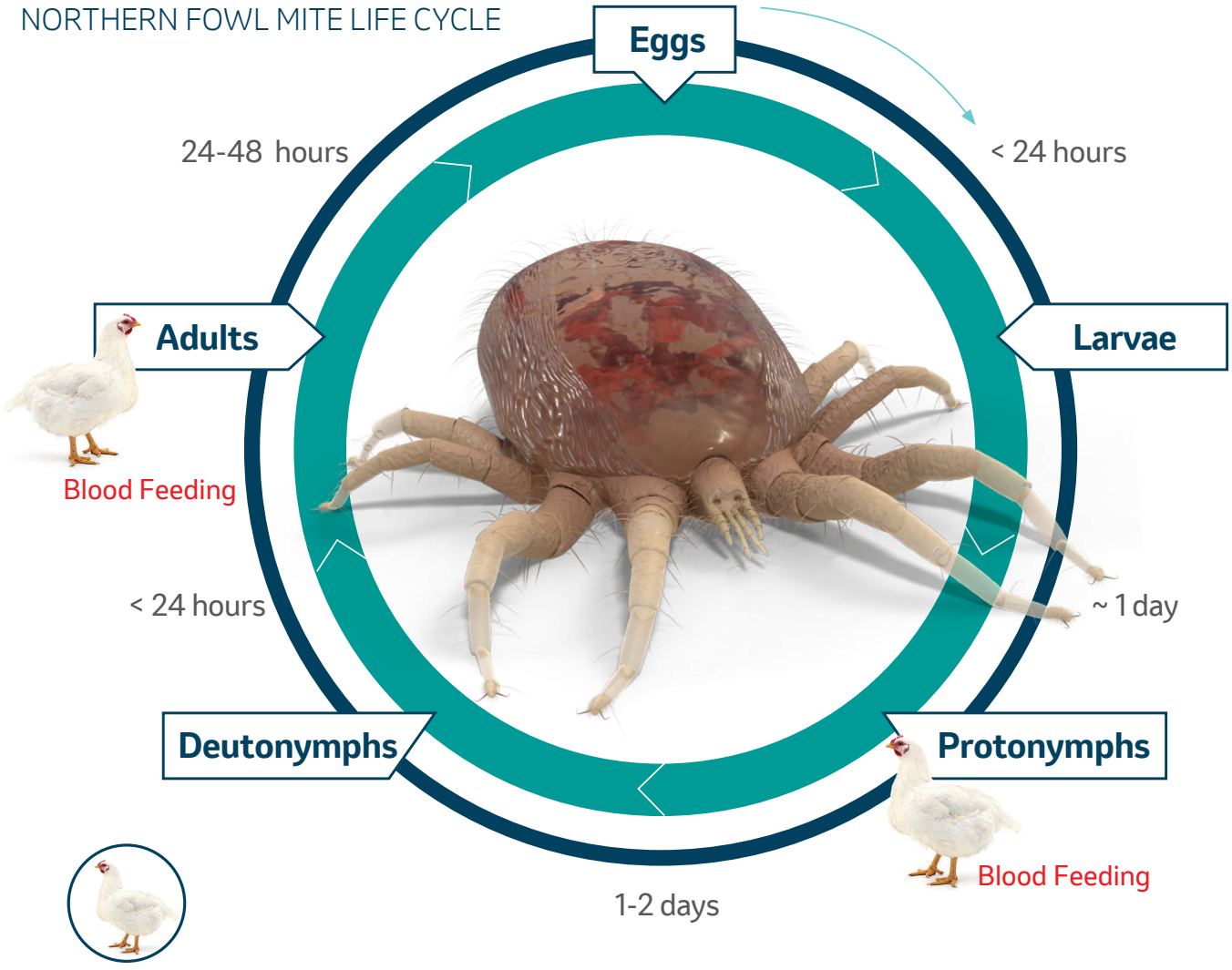
- Treatment of northern fowl mite infestations in laying hens and replacement chickens
- Zero-day withdrawal period for eggs and short 11-day withdrawal for meat or offal
- Safe and well tolerated in layer chickens, with a very wide margin of safety
- Avoids exposure of house workers and birds to chemical sprays
- Dosage regimen spans two mite life cycles—achieving more than 99% mite-killing efficacy[1]
- Ready-to-use solution for simple dilution, with no sedimentation, clogging or spoilage

*Ornithonyssus sylviarum*
Adult northern fowl mite

# THE THREAT OF NORTHERN FOWL MITES IN THE U.S.

Northern fowl mites (*Ornithonyssus sylviarum*) are the primary mite threat in the U.S. These pests can increase rates of anemia, mortality and disease susceptibility while eroding productivity parameters like feed efficiency, egg production, egg quality and weight gain.

NORTHERN FOWL MITE LIFE CYCLE




**Entire northern fowl mite life cycle exists on bird.**

The life cycle of the northern fowl mite, *Ornithonyssus sylviarum*. Aside from the egg, fowl mites have four life-cycle stages: larva, protonymph, deutonymph and adult. Larvae hatch with six legs and do not feed. After the first molt, both nymphal stages and adults have eight legs. Only protonymphs and adult females feed on host blood. All stages remain on the chicken. Eggs mature to adults in as few as 5 days.

## PHYSIOLOGICAL AND ECONOMICAL DAMAGE

Mite bites are painful and induce skin irritation, contributing to high stress levels in infested birds. In addition to experiencing anemia as well as higher rates of mortality and disease susceptibility, flocks infested with mites typically suffer eroded productivity as evidenced by:

- Decreased feed intake
- Decreased egg production
- Decreased egg quality (shell thinning, spotting)
- Decreased weight gain

Economic losses from northern fowl mite infestations severely affect the productivity of the egg industry.

A University of California study published in *Veterinary Parasitology* saw the following results from northern fowl mite infestations:

- Reductions in hen-day egg production by **2.1%-4.0%** during peak infestation periods in heavily infested houses[2]
- Individual hens with higher mite scores had up to **5.6% lower production** compared to lightly infested hens[2]
- Egg weights dropped by **0.3-1.3 grams per egg**, translating to a **0.5%-2.2% reduction**[2]
- Heavily infested hens required **5.7% more feed** per gram of egg produced[2]

The effects of mites can lead to **losses of $0.07-$0.10 per hen** over a **10-week period**. For a house of 28,000 hens, this equates to **$1,960-$2,800** in lost profit.[2]

Current management methods lack sufficient efficacy to keep mite infestations under control at many poultry farms and often pose safety threats for both birds and humans. But Exzolt is different.

# COMBATTING NORTHERN FOWL MITES

Exzolt is a unique parasiticide for chickens that provides potent efficacy against northern fowl mites. Administered through the drinking water, Exzolt provides a convenient oral solution dosage form. Exzolt provides fast, convenient and potent acaricidal efficacy, with proven safety for chickens and the workers administering the product.

## ACTIVE INGREDIENT

Fluralaner (carbamoyl-benzamide-phenyl-isoxazoline), the active substance of Exzolt, is a member of the novel antiparasitic compound class of isoxazoline-substituted benzamide derivatives. Never before used in food animals, fluralaner is truly a new and innovative treatment for poultry. Orally administered, fluralaner reaches target ectoparasites through the gastrointestinal tract and the bloodstream.

## PHARMACOLOGY

Oral medication via medicated drinking water, fluralaner is rapidly absorbed and reaches maximum plasma concentrations 36 hours after the first administration and 12 hours after the second administration. The drug is highly bioavailable (~91%), highly bound to proteins, widely distributed throughout the body (highest concentrations in liver and skin/fat), minimally metabolized and eliminated mainly via the hepatic route.

Once ingested by a mite feeding on a treated chicken, fluralaner acts as a potent inhibitor of parts of the arthropod nervous system.

# POTENT EFFICACY

Treating a chicken with Exzolt, rather than treating the chicken's environment, is an innovative approach to targeting mite parasites. Convenient treatment with Exzolt through the drinking water causes effective levels of the acaricide to be systemically distributed within all birds, ready to kill mites whenever parasites extract a blood meal from their hosts.

At the recommended dosage regimen of 0.227 mg fluralaner/lb body weight (BW) twice, seven days apart, near-total elimination of mite populations in clinical-trial-treated houses was quickly achieved in all laying hen and replacement chicken houses.

## EXZOLT

- Induces a rapid and massive decrease in mite populations in a chicken house
- Treats the bird, not just the environment
- Starts quickly (within four hours), with prolonged duration in birds spanning two mite life cycles
- Offers high bioavailability and systemic distribution in poultry
- Acts against mites resistant to classical acaricides

## TREATMENT REGIMEN

The recommended treatment regimen for Exzolt (0.227 mg fluralaner/lb BW twice at a seven-day interval) was identified as a result of a pivotal pharmacokinetic study examining the use of Exzolt according to label recommendations and assessment of the fluralaner pharmacokinetic profile after oral administration via drinking water.[1]

The objective of the dose-determination studies was to select a treatment regimen that provides efficacy for the duration of two consecutive mite life cycles (~15 days). Mite development from egg to the first blood-feeding stage (hematophagous protonymphs) normally occurs within three to five days, and a blood meal is required for further development of protonymphs to deutonymphs to adults and also for production of mite eggs. Thus, the mite life cycle is disrupted due to the rapid onset of fluralaner activity, the very high mite-killing efficacy (duration of at least two mite life cycles) and the absence of egg production from female mites exposed to treated chickens. Data indicates Exzolt is more effective than traditional spray products for rapidly and dramatically decreasing building infestation burdens.[1]

## TREATMENT PROGRAM

Administer 0.227 mg fluralaner/lb BW to the drinking water twice, seven days apart. Exzolt is a ready-to-use solution for simple dilution, with no sedimentation or clogging.

When used in conjunction with proper biosecurity measures, Exzolt's treatment program of two doses seven days apart fights and contributes toward long-term control of mite populations in poultry houses.

## MITE CONTROL IN THE WATER

- Treats all birds, unlike hit-and-miss spraying
- More convenient and simpler application than sprays
- Uniform dosing accuracy
- Two short one-day administrations, one week apart
- Flexible; easy-to-tailor treatment to bird management programs (feeding, housing, etc.)
- Reduced labor compared to sprays and other treatment methods
- Resealable, multiple-entry container

# SAFETY

Containing fluralaner, Exzolt is a potent yet safe acaricide from a new chemical class and the first isoxazoline approved for use in poultry. Exzolt is well tolerated in chickens, with a very wide margin of safety and avoids exposure of house workers and birds to chemical sprays.

## WORKER SAFETY

Administration through the drinking water minimizes the potential of chemical exposure to human workers. Treatment compliance is also enhanced by convenient administration of the ready-to-use solution in drinking water, greatly reducing the workload for house workers compared to spraying (e.g., removing birds and/or eggs, multiple administrations, quarantines, less safety equipment, administration license requirements, fewer safety precautions, etc.).

## ANIMAL WELFARE[3]

- Two target animal safety studies demonstrated that Exzolt was well tolerated and palatable in both very young birds as well as adult hens under high physiological stress related to intensive egg production, even when dosed at 5 times the recommended dose for 3 times the recommended duration of treatment (no adverse impacts on health, egg production or growth performance).
- Reproductive safety studies demonstrated that Exzolt is well tolerated in layer breeder and broiler breeder chickens, even at 6 times the intended total dosage (no adverse effects on fertility hatchability, chick viability or overall reproductive performance).
- Use of Exzolt at the recommended daily dose rate of 0.023ml per lb BW twice at a 7-day interval clearly offers a wide margin of safety for laying hens and replacement chickens and has no impact on water consumption.
- Eggs from hens treated with Exzolt are not harmful to consumers, and NO withdrawal period is necessary before collection of eggs for human consumption (even on the day of administration or between administration days). A withdrawal period of 11 days after last administration of Exzolt is required for human consumption of meat.

## ASSURED SAFETY

- Zero-day withdrawal period for eggs from layers
- Not stressful for hens
- No harm on egg production, hatchability or progeny
- Broad safety margin

Use of Exzolt at the recommended daily dose rate of 0.227 mg/lb BW twice at a seven-day interval offers a wide margin of safety for all classes of pullets, breeders and layers and does not impact rates of water consumption.

# DISCOVER BREAKTHROUGH MITE CONTROL

Exzolt represents an innovative, completely new approach for comprehensive management of northern fowl mites in chickens, providing systemic acaricidal activity within the bird instead of relying on external contact with a pesticide or other treatment compounds. Only Exzolt offers a unique combination of features and benefits that, together, distinguish the product as a major advancement for optimizing the health and productivity of laying hens and replacement chickens.


## EXZOLT SUMMARY

- Induces a rapid and massive decrease in mite populations in a chicken house, with demonstrated 99%+ efficacy
- Fast kill starts within hours of administration, and the two administrations a week apart span two mite life cycles, thus disrupting mite population dynamics
- Convenient treatment in the drinking water at a low dose of .227 mg fluralaner/lb BW per day, repeated one week later, allows uniform and accurate dosing compared to other control methods
- Ready-to-use solution (1% fluralaner, 10 mg/mL) for simple dilution, with no sedimentation, clogging or spoilage
- More effective, safe, targeted and convenient than mite sprays
- Ideal for laying hens due to zero-day withdrawal period for eggs
- Avoids exposure of house workers and birds to toxic sprays
- Short 11-day withdrawal for meat or offal

**IMPORTANT SAFETY INFORMATION:** EXZOLT™ (fluralaner oral solution)

Not for use in humans. Keep this and all drugs out of the reach of children. Accidental exposure may cause skin and eye irritation. Accidental ingestion may cause gastrointestinal disturbances and hypersensitivity reactions in humans. Chickens must not be slaughtered for human consumption for 11 days after the last treatment. No egg discard is required when used according to the labeling. For complete safety information and product dosing instructions, refer to the product label.

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[1] Data on File, Merck Animal Health.

[2] Mullens, B. A., Owen, J. P., Kuney, D. R., Szijj, C. E., & Klingler, K. A. (2009). Temporal changes in distribution, prevalence and intensity of northern fowl mite (*Ornithonyssus sylviarum*) parasitism in commercial caged laying hens, with a comprehensive economic analysis of parasite impact. *Veterinary Parasitology*, 160(1-2), 116-133.

[3] Data on File, Merck Animal Health.


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