Malassezia pachydermatis infection is frequently undiagnosed, as making a diagnosis is often difficult when clinical signs overlap a number of other clinical conditions (e.g., atopic dermatitis, seborrhea). In addition, there are no consistently effective quantitative cytology techniques.

Response-to-treatment trials are an important component in diagnosing Malassezia spp dermatitis. Treatment should be considered when yeast has been identified on cytology in a patient showing clinical signs compatible with Malassezia spp dermatitis. Recurrent M. pachydermatis overgrowth is common and often secondary to underlying conditions (e.g., allergies, seborrhea, endocrinopathies, skinfolds).

In addition to acute management of infection, treatment success relies on appropriate diagnosis and management of predisposing conditions.

**SYSTEMIC THERAPY**

**Ketoconazole**

**Dogs:** 5-10 mg/kg PO once a day for 2-4 weeks

**Cats:** Not recommended because of high incidence of side effects

Ketoconazole, an imidazole antifungal, impairs ergosterol synthesis in fungal cell walls by inhibiting cytochrome P450 14 α-demethylase (CYP51). Ketoconazole has efficacy against a wide range of fungal organisms and has been shown to have anti-inflammatory effects. Most commonly used systemic treatment for dermatitis caused by M. pachydermatis in dogs

**Itraconazole**

**Dogs:** Daily treatment, 5-10 mg/kg PO once a day for 2-4 weeks; pulse treatment, 5-10 mg/kg PO for the first 2 days of each week

**Cats:** 5-10 mg/kg PO once a day for 2-4 weeks

Itraconazole, a triazole antifungal, inhibits CYP51, resulting in impaired ergosterol synthesis in fungal cell walls. Itraconazole is lipophilic and highly protein-bound, and therapeutic levels persist in the skin days to weeks after treatment is stopped. This principle likely explains why pulse treatment appears to be effective.

**Fluconazole**

**Dogs:** 5-10 mg/kg PO once a day for 2-4 weeks

Malassezia pachydermatis William Oldenhoff, DVM, DACVD Pittsburgh Veterinary Specialty & Emergency Center Pittsburgh, Pennsylvania

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Although many topical products are available for treating *Malassezia* spp dermatitis, only a few controlled studies have documented efficacy.\(^3,11\)

**Cats:** Fluconazole treatment of *M. pachydermatis* infections in cats has not been studied.

Like itraconazole, fluconazole is a triazole antifungal that impairs ergosterol synthesis in fungal cell walls via inhibition of CYP51.\(^1,2,6,7\) Fluconazole is comparable in efficacy to ketoconazole in treating *Malassezia* spp dermatitis in dogs.\(^6\)

**Terbinafine**

**Dogs:** 30 mg/kg PO once a day\(^8,9\) or 30 mg/kg PO for 2 consecutive days each week for 3-4 weeks\(^10\)

**Cats:** Terbinafine treatment of *M. pachydermatis* infections in cats has not been studied.

Terbinafine, an allylamine antifungal drug, inhibits ergosterol synthesis and squalene epoxidase, resulting in ergosterol deficiency and squalene accumulation in fungal cell walls. It does not inhibit cytochrome P450 enzymes. Although terbinafine has been shown to reduce *M. pachydermatis* populations and dermatitis in dogs treated for 3 weeks, longer durations of therapy or adjunctive use of topical agents may be necessary to achieve resolution.\(^9,9,10\)

**Griseofulvin**

**Dogs, cats:** Not recommended for use in dogs or cats\(^1,2\)

Griseofulvin inhibits cell mitosis and nucleic acid synthesis in fungal organisms by interfering with spindle microtubules. However, this agent is not effective in treating *Malassezia* spp dermatitis in dogs or cats.

**TOPICAL THERAPY**

**Antifungal Shampoos**

**Dogs, cats:** Some topical products supported by clinical evidence.\(^3,11\)

- Strong evidence supports twice-weekly use of 2% miconazole + 2% chlorhexidine shampoo.\(^3\)
  - For both dogs and cats, including puppies and kittens
- Once- or twice-daily application of 0.3% chlorhexidine + 0.5% climbazole and Tris-EDTA wipe has been shown to reduce *M. pachydermatis* populations in naturally infected dogs.\(^11\)
  - For dogs only
  - May also be effective in dogs with localized overgrowth of *M. pachydermatis*

Antifungal shampoos can be an important component in treating *Malassezia* spp dermatitis. For mild-to-moderate or localized infections, they may be the sole therapy. For generalized or severe infections, topical therapy should be combined with systemic therapy.

- Although many topical products are available for treating *Malassezia* spp dermatitis, only a few controlled studies have documented efficacy.\(^3,11\)
- Further studies are needed to evaluate other topical products.

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**References**

3. Negre A, Bensignor E, Guillot J. Evidence-based veterinary dermatology:

Suggested Reading

Adverse Reactions
Field safety was evaluated in 306 dogs. Based on the results of two studies, GI abnormalities (vomiting, soft stools, diarrhea, and inappetance) were the most common adverse reactions associated with the administration of meloxicam. The following table lists adverse reactions and the numbers of dogs that experienced them during the studies. Dogs may have experienced more than one episode of the adverse reaction during the study.

In foreign suspected adverse drug reaction (SADR) reporting over a 9 year period, incidences of adverse reactions related to meloxicam administration included: auto-immune hemolytic anemia (1 dog), thrombocytopenia (1 dog), polyarthritis (1 dog), nursing puppy lethargy (1 dog), and pyoderma (1 dog).

Post-Approval Experience: [Rev 2010]
The following adverse events are listed in post-approval adverse drug experience reporting. Not all adverse reactions 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 are listed in decreasing order of frequency by body system.

Gastrointestinal: vomiting, anorexia, diarrhea, melena, gastrointestinal ulceration
Hepatic: azotemia, elevated creatinine, renal failure
Neurological/Behavioral: lethargy, depression
Hypersensitivity: elevated liver enzymes
Dermatologic: pruritus

Death has been reported as an outcome of the adverse events listed above. Acute renal failure and death have been associated with use of meloxicam in cats.

Effectiveness: The effectiveness of meloxicam was demonstrated in two field studies involving a total of 277 dogs representing various breeds, between six months and sixteen years of age, all diagnosed with osteoarthritis. Both of the placebo-controlled, masked studies were conducted for 14 days. All dogs received 0.2 mg/kg daily. All dogs were maintained on 0.1 mg/kg oral meloxicam from days 2 through 14 of both studies. Parameters evaluated by veterinarians included lameness, weight-bearing, pain on palpation, and overall improvement. Parameters assessed by owners included mobility, ability to rise, limping, and overall improvement. In the first field study (n=109), dogs showed clinical improvement with statistical significance after 14 days of meloxicam treatment for all parameters. In the second field study (n=45), dogs receiving meloxicam showed a clinical improvement after 14 days of therapy for all parameters; however, statistical significance was demonstrated only for the overall investigator evaluation on day 7, and for the owner evaluation on day 14.

How Supplied: Meloxicam® 1.5 mg/ml, Oral Suspension. 10 mcL, 30, 100 and 200 mcL, bottles with small and large dosing syringes.

Manufactured by: Ceva Santì Animali, S.A.
Marketed by: Ceva Animal Health, LLC, Lenoir, KS 68215
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