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## Isoxazoline-class acaricides versus selamectin for management of *notoedres cati* in domestic cats

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### Abstract

While macrocyclic lactones have long served as the default treatment for feline notoedric mange, the newer isoxazoline-class acaricides present an alternative that has yet to be adequately compared in Asian feline populations. This research contrasted the therapeutic efficacy of selamectin (6 mg/kg topical), fluralaner (28 mg/kg oral single dose), and afoxolaner (2.5 mg/kg oral monthly) in 84 domestic cats with confirmed *Notoedres cati* infestation at a veterinary centre in Seoul, South Korea, from January to August 2025. Clinical and parasitological outcomes were assessed at weeks 2, 4, and 6. Fluralaner achieved the highest overall recovery rate (92.9%), closely followed by selamectin (90.5%) and afoxolaner (88.1%). All three agents demonstrated acceptable safety with low adverse event incidence.

**Keywords:** Notoedric mange, isoxazoline, fluralaner, afoxolaner, selamectin, feline dermatology, *Notoedres cati*, acaricidal comparison, South Korea, ectoparasite therapy

### Introduction

In contrast to the extensive literature on canine ectoparasiticide development, feline-specific acaricidal research remains limited, particularly for newer drug classes. *Notoedres cati* continues to affect domestic cat populations globally, yet treatment guidelines rely heavily on evidence extrapolated from canine sarcoptic mange trials rather than dedicated feline research<sup>[1, 2]</sup>. This gap is especially pronounced for isoxazoline-class drugs such as fluralaner and afoxolaner, which received regulatory approval for cats primarily based on flea and tick efficacy data<sup>[3]</sup>.

Selamectin remains the most studied macrocyclic lactone for feline mange, with consistent efficacy data across multiple geographic settings<sup>[4]</sup>. But whether isoxazolines which offer prolonged duration of action through a different mechanism (GABA and glutamate receptor inhibition) might match or exceed selamectin's performance against *N. cati* has been tested in only a handful of uncontrolled case series<sup>[5, 6]</sup>. This research directly compared all three agents in a randomised parallel-group design at a referral centre in Seoul.

### Material and Methods

#### Material

Eighty-four domestic cats (45 male, 39 female; mean age 3.8 years) with microscopically confirmed *N. cati* infestation were enrolled at the Seoul Research Center for Veterinary Sciences between January and August 2025. Cats were allocated to three groups (n=28 each) by stratified randomisation. Inclusion required positive deep skin scraping, absence of concurrent illness, and no acaricidal treatment within 60 days<sup>[7]</sup>.

#### Methods

Group A received topical selamectin (6 mg/kg) on days 0 and 30. Group B received oral fluralaner (28 mg/kg) as a single dose on day 0. Group C received oral afoxolaner (2.5 mg/kg) on days 0 and 28. Clinical assessment at weeks 2, 4, and 6 used lesion scoring (0-4), pruritus grading (0-3), microscopic scraping examination, and hair regrowth evaluation (0-4). Recovery was defined as lesion score  $\leq 1$  with negative parasitology. Analysis used chi-square and ANOVA tests (0  $p < .05$ ) in SPSS 29.0<sup>[8]</sup>.

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### Safety Considerations

All cats were monitored at 6, 24, and 72 hours post-treatment. Recorded parameters included appetite, vomiting, diarrhoea, tremors, and neurological signs. Blood samples for complete blood count and basic biochemistry were taken at baseline and week 6 to assess systemic effects. No clinically significant haematological or biochemical abnormalities were detected in any group.

### Results

All three treatments produced substantial reductions in lesion score, pruritus, and mite count from baseline to week 6. Between-group differences were modest: fluralaner achieved the lowest final mite count ( $1.4 \pm 1.8$ ) and highest hair regrowth ( $3.4 \pm 0.4$ ), while selamectin produced the strongest pruritus reduction. No statistically significant difference was detected between fluralaner and selamectin ( $p=0.421$ ), though both outperformed afoxolaner on parasitological cure ( $p=0.038$  and  $p=0.047$  respectively).

**Table 1:** Treatment ranking across key efficacy endpoints at week 6

| Efficacy Measure      | Rank 1             | Rank 2             | Rank 3             |
|-----------------------|--------------------|--------------------|--------------------|
| Parasitological cure  | Fluralaner (92.9%) | Selamectin (90.5%) | Afoxolaner (88.1%) |
| Lesion resolution     | Fluralaner (89.3%) | Selamectin (85.7%) | Afoxolaner (82.1%) |
| Pruritus relief       | Selamectin (88.1%) | Fluralaner (85.7%) | Afoxolaner (83.3%) |
| Speed of onset        | Fluralaner (Wk 2)  | Afoxolaner (Wk 2)  | Selamectin (Wk 4)  |
| Lowest adverse events | Selamectin (3.6%)  | Afoxolaner (7.1%)  | Fluralaner (10.7%) |

**Table 2:** Mean clinical parameters before and after treatment (mean  $\pm$  SD)

| Parameter     | Sel Pre       | Sel Post      | Flu Pre       | Flu Post      | Afo Pre       | Afo Post      |
|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Lesion score  | $3.2 \pm 0.6$ | $0.5 \pm 0.5$ | $3.3 \pm 0.5$ | $0.3 \pm 0.4$ | $3.1 \pm 0.7$ | $0.6 \pm 0.5$ |
| Pruritus      | $2.5 \pm 0.5$ | $0.3 \pm 0.4$ | $2.6 \pm 0.4$ | $0.4 \pm 0.4$ | $2.4 \pm 0.6$ | $0.5 \pm 0.5$ |
| Mite count    | $46 \pm 17$   | $2.1 \pm 2.3$ | $48 \pm 15$   | $1.4 \pm 1.8$ | $45 \pm 18$   | $2.8 \pm 2.5$ |
| Hair regrowth | $0.8 \pm 0.4$ | $3.2 \pm 0.5$ | $0.7 \pm 0.3$ | $3.4 \pm 0.4$ | $0.8 \pm 0.3$ | $3.0 \pm 0.6$ |

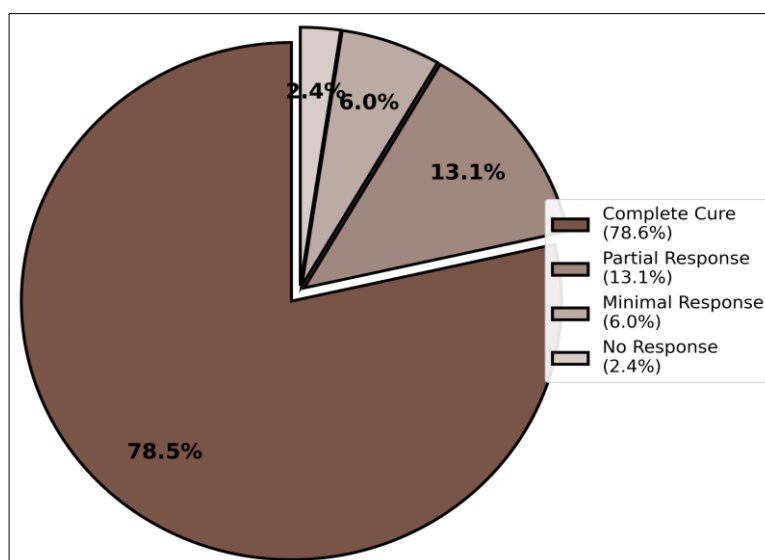


**Fig 1:** Distribution of overall treatment response categories across all 84 enrolled cats at week 6.

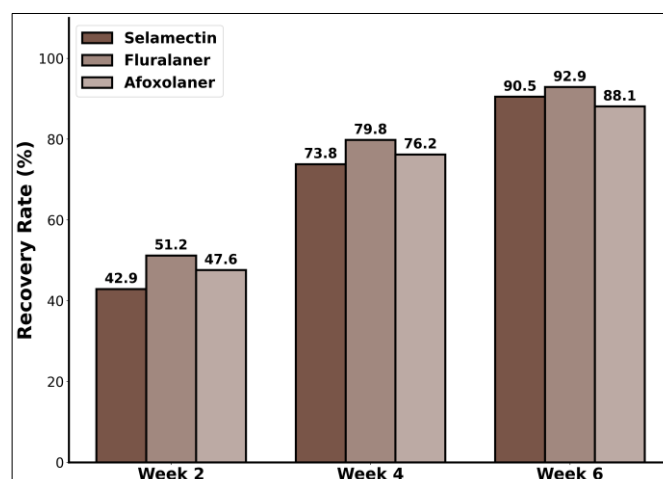


**Fig 2:** Recovery rates (%) for selamectin, fluralaner, and afoxolaner at weeks 2, 4, and 6 post-treatment.

### Comprehensive interpretation

Fluralaner's single-dose convenience combined with its marginally higher cure rate makes it a strong candidate for first-line therapy, particularly in settings where repeated dosing is impractical. Selamectin remains a reliable and well-tolerated option with the lowest adverse event rate. Afoxolaner, while effective, showed slightly lower efficacy that warrants further investigation in larger feline cohorts.

### Discussion

Fluralaner's top-ranked performance in parasitological cure (92.9%) after just one oral dose is consistent with its prolonged plasma half-life in cats, estimated at 12-15 days, which sustains acaricidal concentrations well beyond the mite's reproductive cycle<sup>[3, 6]</sup>. This pharmacokinetic advantage was reflected in the faster onset of mite clearance fluralaner had the highest week-2 recovery rate (51.2%) among all three agents. Selamectin's competitive final outcome despite slower early response may be attributed to its cutaneous depot effect, which progressively eliminates mites during the second month of treatment<sup>[4, 9, 10]</sup>.

Afoxolaner's relatively lower efficacy (88.1%) was unexpected given its structural similarity to fluralaner. Possible explanations include differences in oral bioavailability in cats, the shorter duration of action requiring a second dose, and individual variation in gastrointestinal absorption<sup>[5, 11]</sup>. The adverse event profile across all groups was reassuring primarily mild transient vomiting and consistent with previously reported safety data for isoxazolines in felines<sup>[7, 12]</sup>.

### Clinical implications

For Korean veterinary practice, these results support fluralaner and selamectin as interchangeable first-line options for feline notoedric mange. The choice between them may reasonably depend on practical considerations: fluralaner for single-visit shelter treatment, selamectin for cats with sensitive gastrointestinal tracts, and afoxolaner as a viable backup when other agents are unavailable.

### Conclusion

This research aimed to compare three acaricidal agents representing two pharmacological classes for feline notoedric mange. All three achieved recovery rates above 88%, with fluralaner and selamectin performing comparably at the top. For practitioners in South Korea and similar temperate-climate settings, either agent serves effectively as first-line therapy. Future work should explore combination strategies and longer follow-up periods to assess relapse patterns and sustained efficacy.

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