New systemic treatment for poultry red mite infestation in layers

Poultry red mite infestation represents a major threat to layer welfare. A recent epidemiological review reports that 83% of European farms are infested by Dermanyssus gallinae. This prevalence reaches 94% in The Netherlands, Germany and Belgium.

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The presence of mites in a production house induces a high level of stress in birds. Stress is induced by pain and skin irritation associated with repeated mite bites favoured by the very high parasite load typical of poultry red mite infestations, with mite densities ranging from 25,000-500,000 mites per hen.

In addition, mite infestations induce aggressive feather-pecking and cannibalistic behaviour, increased feed and water intake, and decrease general animal health.

Higher noise volumes are typically observed by farmers in mite infested houses. Increased self-grooming, a characteristic symptom of anxiety, is observed in artificially infested hens.

The severity of injuries resulting from such behaviour is currently limited by beak-trimming, but is expected to increase now that beak trimming has been banned across several European member states since 2016.

Poultry red mite infestation decreases general health and productivity parameters. The first clinical sign observed in infested animals is sub-acute anaemia due to repeated mite bites.

A laying hen can lose more than 3% of its blood volume every night. In extreme cases, D. gallinae infestation burdens may be so heavy that hens may die from severe anaemia. Mortality is increased mainly in cases of severe infestations.

The ban of traditional cages has caused the move to complex housing environments, favouring the proliferation of the parasites by offering far more hiding places for mites to escape classical treatments. For all these reasons, poultry red mite infestation is widely recognised as an animal welfare issue by the scientific community.

Effective control needed

Welfare concerns, production losses caused by the poultry red mite, and widespread mite resistance to environmentally applied acaricides continue to drive an urgent need for new and effective control measures. The few treatments currently approved for use in the presence of hens are mostly sprays, which is stressful when applied to animals.

Exzolt is a new systemic mite treatment developed to address that need.

It contains the novel systemic acaricide fluralaner, and is administered orally to the birds through drinking water, which is not stressful to the birds and ensures that all mites are exposed to the product when feeding.

A recent study has demonstrated the very high and consistent in vitro activity of fluralaner against D. gallinae isolates collected under field conditions in Europe. No adverse reactions were observed following treatment with Exzolt of layers dosed at five times the recommended dose for three times the recommended duration of treatment.

Exzolt is approved as a veterinary medicinal product in Europe and a zero-day withdrawal time has been established for eggs by the European Medicine Agency.

Study objectives

A multi-site field study was initiated to investigate the efficacy of Exzolt when used in drinking water for the treatment of natural poultry red mite infestations in infested caged layer farms in Europe.

This controlled and blind study also evaluated the effects of Exzolt on production parameters indicating well-being of the hens, and verified its safety under field conditions.

Materials and methods

Five enriched caged layer farms naturally infested with Dermanyssus gallinae in France and Spain, having two similar houses (flock size, age, breed, feed, drinking water system), were selected for the study. The houses contained 19,000-100,000 hens aged from 22-58 weeks at treatment initiation.

Mite infestation levels were evaluated pre-treatment, during and at weekly or two-weekly intervals post-treatment, using mite traps (18-24 per house), fixed at different places close to the hens. At each evaluation day, traps were placed for 24 hours, removed, frozen and shipped to a central laboratory for mite counting and development stage differentiation.

On each farm, the treatment was allocated to the house with the highest infestation, for animal wel-

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Mite infested hen with anaemia and decreased general health (A. Camarda, Univ. Bari).

Table 1. Reduction of mite populations after initiation of treatment with Exzolt. Exzolt was used on days zero and seven.

Farm	Reduction in mite counts (%)		
	Day 3	Day 9	Day 14
1	96.9	99.6	99.9
2	96.0	99.9	99.9
3	99.4	100	100
4	95.3	100	99.8
5	99.4	100	100
	>95.3%	>99.6%	>99.8%

Mite colonies on equipment beneath the hens (enriched cages).

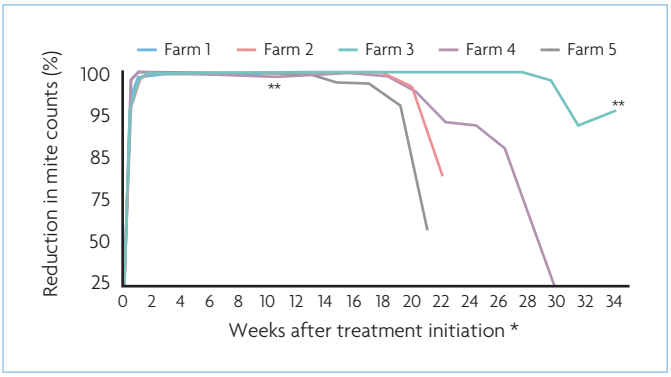

Fig. 1. Reduction of mite populations after initiation of treatment with Exzolt. *treatment administered on day zero and seven. **end of production cycle (farms 1 and 3).

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fare reasons. The control house was left untreated. Exzolt was administered via drinking water, using a dosing pump, at 0.5mg fluralaner/kg bodyweight, twice seven days apart.

The reduction in mite counts in the treated house versus control was calculated using the Henderson-Tilton formula for the mean mite counts (mobile stages) per trap, at regular post-treatment time points.

Production parameter indicators of well-being, which included laying rate, mortality, and proportion of downgraded eggs (data available in two farms), were recorded weekly before and after treatment.

Results

In all farms, the reduction of the mite population started quickly after treatment initiation; it exceeded 95% based on mite counts in traps placed in the houses three days after treatment initiation. Two days after the second Exzolt administration, the reduction of mite population ranged from 99.6-100% (Table 1).

The reduction in mite counts reached 100% from 6-13 weeks post treatment initiation in the majority of the farms. The efficacy was maintained above 90% until the end of the egg production cycle (three to eight months) in three farms and for four months in two farms (Fig. 1).

In all the farms, the control of mite populations was associated with numerically higher laying rates (0.9-5.7%) (Fig. 2) and with lower mortalities (-0.01 to -0.15%).

The proportion of downgraded eggs, measured in two farms, was numerically lower by -1.1% and -3.4% in the treated houses. No treatment related adverse effects were observed.

Conclusion

This study demonstrated that systemic treatment with Exzolt resulted in safe and non-stressful control of poultry red mite, and positively impacted layers' welfare performance indicators. The results indicate that this novel treatment has the potential to be the cornerstone of an integrated approach to reducing or eliminating the welfare and productivity costs of this increasingly threatening pest. ■

References are available from the author on request

Fig. 2. The impact of Exzolt treatment on laying rates between treated and controlled housing.