

DOSE TITRATION AND DOSE CONFIRMATION IN SALMON

Four trials were conducted in Scotland over a two-year period to determine and confirm the optimum dose rate of emamectin benzoate. Atlantic salmon (*Salmo salar*) ranging from 150 - 400 grams body weight were given a pelleted feed coated with emamectin benzoate in fish oil.

During each of these trials, treatment groups were fed the emamectin benzoate-medicated diet at various dose rates for 7 consecutive days from Day 0 to Day 6. Control groups were fed the same unmedicated commercial feed at the same rate. Efficacy was assessed by counting the number of sea lice on all fish at Day 7, Day 14 and Day 21.

A total of 580 Atlantic salmon were utilized in the dose titration and dose confirmation studies, with 414 fish in treatment groups that received medicated feed and 166 fish in the control groups fed an unmedicated diet.

Results and Significant Findings

Results of trials 1a and 1b (see table, opposite) indicated that a emamectin benzoate medicated diet given to fish for 7 consecutive days (at dose rates between 20 and 100 µg/kg/day) resulted in effective control of both non-motile (chalmus) and motile (pre-adult and adult) stages of sea lice.

Trial 2, designed to determine the optimal dose rate of emamectin benzoate, indicated that a medicated diet fed at a dose rate of 25 to 50 µg/kg/day for 7 days, provided control of all parasitic stages

of the sea louse, *Lepeophtheirus salmonis*. This was further validated in subsequent Dose

Confirmation Trials (3 and 4), which resulted in the selection of 50 µg/kg/day as the dose rate for

commercial product development.

Fish consumption of the emamectin benzoate medicated feed equaled or exceeded feed intake

rates of unmedicated control groups, thus indicating similar palatability.

Emamectin benzoate

treatments were physiologically well tolerated by all groups, with no adverse reactions or mortality

observed at or above the selected dose regime.

Dose Titration and Confirmation Studies						
Trial	Description/Objective	Sample Size	% Efficacy ^a			Summary Results
			Day 7	Day 14	Day 21	
1a
1b
2
3
4

EFFICACY FIELD TRIALS: SCOTLAND

These extensive field studies conducted in Scotland on approximately 49,000 Atlantic Salmon (ranging from 150g - 2.0kg bodyweight), were the first in which monensin leucovorin was administered as SLICE[®] granules (0.2% active ingredient concentration). During the trials, all treatment groups were fed SLICE medicated feed at a daily dose rate of 50 g/kg/day for 7 consecutive days and feeding rate of 0.5% biomass/day.

In contrast to previous studies conducted in tanks, this series of efficacy trials was conducted under typical production conditions, i.e. salmon were held in sea water cages. SLICE effectiveness against another common sea louse species, *Caligus elongatus* was also assessed and the efficacy against the sea louse species, *L. californicus* was confirmed.

In addition to the seasonal, continuous infestation by these two sea louse species (with constant infestation pressure from both copepodite and mobile stages), the efficacy of SLICE was evaluated under a variety of diverse field conditions. Sea water temperatures ranged from a high of 15.5°C in the August trials to a low of 5.8°C during the winter field trials held in February. The salinity during these studies varied between 25.5 - 35.0 ppt.

Result Summary

Efficacy: The efficacy of SLICE treatment against *Lepidoteleia* infested in 4 studies increased from 21% - 67% one day after treatment (Study Day 7) to approximately 90% by 15 days after treatment (Study Day 21). This efficacy pattern was observed even as sea lice populations were rapidly increasing 2-3 fold on control fish (Trials 6 & 7). The efficacy was unaffected by variations in water temperature and salinity. As verified by these results, administration of SLICE medicated feed consistently proved to be nearly 90% effective or greater at controlling sea lice even under the most adverse conditions (see table opposite).

Clinical Appearance: The clinical appearance of sea lice infested fish was improved after treatment with SLICE medicated feed.

Mortality: No mortality associated with treatment was observed.

Efficacy Field Trials Scotland

Trial Description/Parameters	Sample Size	% Efficacy*				Summary Results

DOSE CONFIRMATION IN TROUT

A separate efficacy study conducted with Rainbow trout (*Oncorhynchus mykiss*) in Chile further validated the efficacy of manamycin betaine against natural infections of two other *Cyprid* sp.: *C. pholipis* and *C. nris*.

Study Guidelines

- Housing:** 40 Tin x Tin x 100 Cages (50 Trout per Cage)
- Treatment Design:** Allocated into 3 x 2 replicates (each replicate consisted of a SLICE treated pen and an untreated pen)
- Sea Water Temperature:** 11.0°C - 12.5°C
- Salinity Range:** 30 - 32 ppt
- Infection:** Naturally infected with sea lice, *Cyprid* (*pholipis* and *C. nris*)
- Study Design:** Treatment Group: fed SLICE treated feed at a target dose rate of 50µg/kg/day for 7 consecutive days from Day 0 to Day 6
Control Group: received untreated feed throughout the trial
- Data Gathering Criteria:** Trout were randomly selected from each cage on Study Days - 5, 7, 14, 21, 28, 35, 42. Sea lice were counted on 15 fish from each cage.
- Results:** SLICE efficacy against sea lice on trout was equivalent to that observed against sea lice on salmon. The efficacy of SLICE was approximately 90% by 3 days after treatment and remained >90% for at least 36 days after treatment.

Efficacy of SLICE® (manamycin betaine) administered daily in feed for 7 days at a dose rate of 50µg/kg/day against sea lice* (*Cyprid* (*pholipis* & *C. nris*)) on Rainbow trout (*Oncorhynchus mykiss*)

Treatment	% Efficacy*						
Untreated Control	(10.2)	(11.8)	(21.8)	(40.7)	(60.5)	(86.8)	(93.7)
SLICE®	(11.2)	39.1	83.6	94.4	85.0	96.1	83.5

