

Nucleotides aid dietary louse control

Dr CHARLES BURRELLS, Ewos Technology Centre, reports on successful trials with 'Boosterfeed'

A NEW weapon to help salmon farmers in their battle against the sealouse, *Lepeophtheirus salmonis*, has been identified by Ewos. Boosterfeed, its nucleotide-supplemented diet, has already proved its worth in salmonids by increasing resistance to disease (Burrells *et al*, 2001a) and improving vaccine efficacy, osmoregulatory capacity following salt water transfer, and growth and intestinal physiology (Burrells *et al*, 2001b). It has now been shown in trials to be extremely effective in reducing lice infestation, and to lower the rate of reinfestation following cypermethrin bath treatment.

Existing anti-lice treatments operate through inhibition of metabolic mechanisms and biochemical pathways of the parasite. At the chalimus stages, these chemotherapeutants kill large numbers of lice, with survivors developing at a significantly slower rate than in untreated fish.

Despite the success of such treatments, they are extremely stressful for the fish, which may then be subject to re-infestation on return to sea cages.

Encouraged by the general boost to fish health engendered by the Ewos Boosterfeed diet, scientists at Ewos R & D undertook a two-part trial to determine if this nucleotide-supplemented feed would affect sealice infestation rates in Atlantic salmon. The trial first examined infestation rates in fish experimentally exposed to *L. salmonis*, then looked at the incidence of re-infestation following bath treatment with EXCIS, which contains the synthetic pyrethroid cypermethrin.

In both sets of trials, two groups of fish were fed for three weeks with either a control diet, Ewos Vextra or with Ewos Vextra Boosterfeed. The latter group was identified with alcian blue marking to the ventral surface, before the two were mixed and exposed to a challenge infestation with *L. salmonis* copepods.

After 7-9 days, during which time all fish were fed with the control diet, the number of infesting sealice was counted. Boosterfeed-fed fish were found to have 25 per cent less ($p < 0.05$) infesting lice than fish fed the control diet, and this was wholly due to a significant reduction in stage III - IV chalimus (Figure 1).

The second trial exposed the lice-infested fish to a bath treatment with the cypermethrin compound EXCIS, which removed the lice. Seven days after this treatment, the fish were re-exposed to *L. salmonis* copepods and the number of infesting lice counted after 7-9 days. The total number of infesting lice in the group fed with EWOS Boosterfeed was 29.5 per cent less, ($p < 0.05$). Again, this was found to be a direct

consequence of a significant ($p < 0.001$) reduction in stage III - IV chalimus (Figure 2).

These experimental results suggest that the additional nucleotides provided in the Boosterfeed diet act in a number of positive ways. They reduce the physical effects of stress associated with cypermethrin bath treatments; increase the natural non-specific resistance of fish to sealice infestation; and,

in conjunction with cypermethrin treatment, affect the development potential of early chalimus stages of sealice, thereby reducing the numbers of mobile pre-adult lice available to cross-infest other fish.

This latest research is encouraging for fish farmers eager to find new and effective methods to reduce the mortalities and problems caused by sealice infestation.

References

- Burrells, C., Williams, P.D. and Forno, P. (2001a). Dietary nucleotides: a novel supplement in fish feeds. 1. Effects on resistance to disease in salmonids. *Aquaculture*, In Press.
 Burrells, C., Williams, P.D., Southgate, P.J. and Wadsworth, S.L. 2001b. Dietary nucleotides: a novel supplement in fish feeds. 2. Effects on vaccination, salt water transfer, growth rates and physiology of Atlantic salmon (*Salmo salar* L.). *Aquaculture*, In Press.

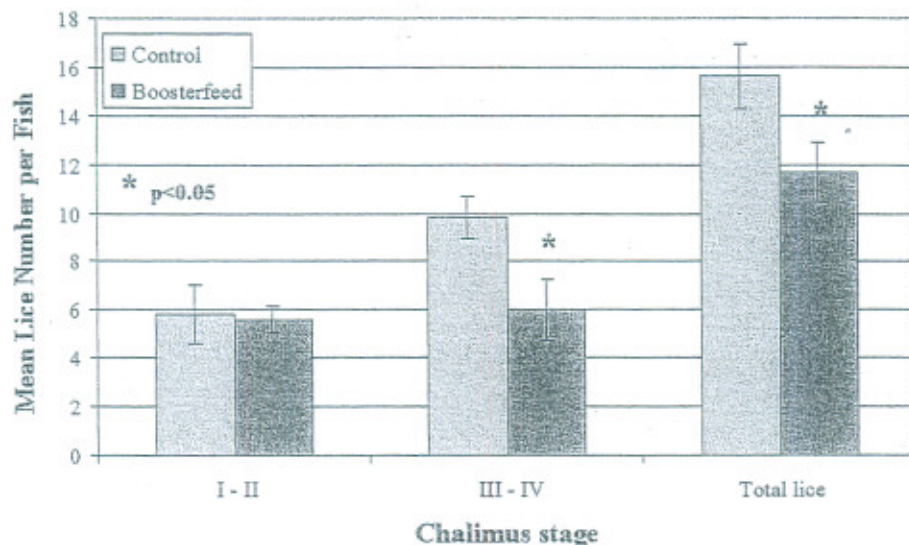


Figure 1. Mean numbers of lice attached to fish fed for 3 weeks with either a control diet, or with EWOS Boosterfeed, 7-9 days after challenge infestation with *L. salmonis* copepods.

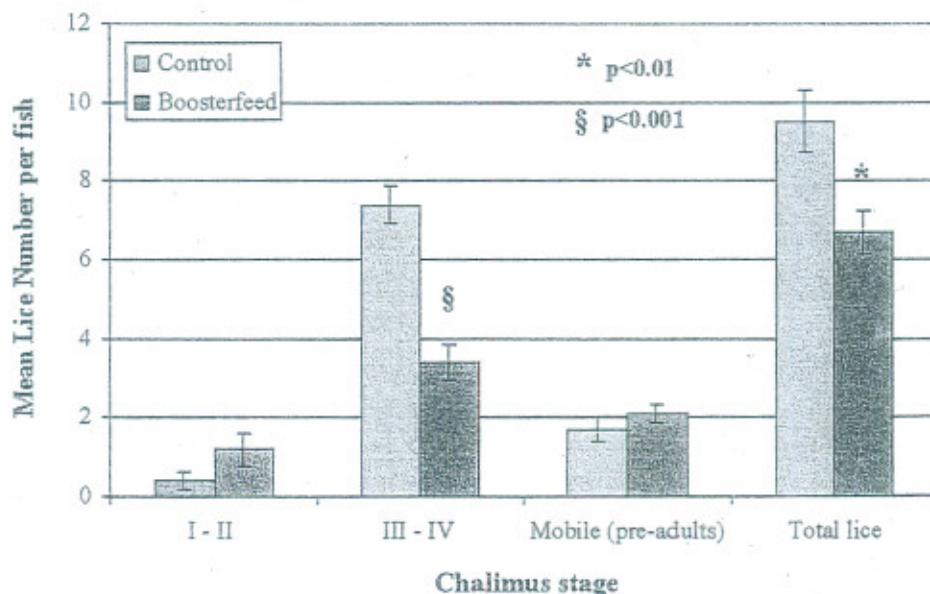


Figure 2. Mean numbers of lice attached to fish fed for 3 weeks with either a control diet or with EWOS Boosterfeed infested with *L. salmonis* copepods, treated with cypermethrin and re-exposed 7 days after treatment.