



David B. Powell, Ph.D.
Roger C. Palm, Jr., Ph.D.
17806 NE 26th St.
Redmond, WA 98052
(425) 883-9896

Discussion:

We successfully developed a model test system to evaluate palatability enhancers in rainbow trout. Under normal conditions, Romet-30 milled into the feed at the recommended concentration (1.67%) is palatable to healthy trout when given at the registered dose of 1% body weight per day (50 mg active ingredient/kg fish for 5 days). Fish fed twice as much at half the concentration, or half as much at twice the normal concentration, also completely consumed the medicated feeds. However, since fish infected with bacteria often exhibit reduced feeding, we decided to develop a methodology that would mimic this situation as part of the experimental model. This lower appetite was simulated by providing additional control feed (1.5 % body weight) each morning prior to dispensing the experimental Romet feeds. This practice was reasonable because the negative control fish (not receiving Romet) ate the control feeds rapidly and completely. Experiment 1 also revealed that the fish grew consistently about 2.5% per day. This growth rate was used to recalculate the feeding ration for each individual tank each day. Such a procedure is not often used on production farms, so it is possible that our test fish received more antibiotic feed than might be typically used at commercial facilities.

The Experiment 2 results clearly suggest that the addition of fish oil to the surface of feed containing Romet-30 significantly reduces its palatability. One explanation for this effect may be that these antibiotic compounds are very lipid soluble and are dissolving into the oil, thereby increasing the bitter flavor of these feeds. The low peroxide value and the freshness of the oil (taken directly from the feed mill only days before pelleting) are strong indications that the oil itself was palatable to the trout. The addition of 6% HFPC appeared to substantially enhance the palatability of feeds containing Romet without oil top dressing.

The addition of squid flavoring (with or without HFPC) in Experiment 3 did not sufficiently overcome the negative effects of adding fish oil to the surface of Romet feeds. The alginate coating with squid and HFPC additives showed the most improvement in this test. The results also indicate that the strain of rainbow trout may influence the feeding response to rations containing Romet. The fact that the fish groups tested in Experiment 2 and Experiment 3 both averaged 19 grams at the start of each trial suggests that size or stage of development was not a factor in this comparison.

Recommendations:

Our results suggest the following procedures for use in rainbow trout (with possible applicability to other species) to reduce or eliminate problems of reduced palatability of feeds containing Romet:

1. Start the feeding of antibiotic as soon as possible, while the fish still have a reasonable appetite. Taking the fish off feed one or two days, while the decision whether to treat is being made, could also benefit appetite and water quality.
2. Reduce or eliminate oil additions to the surface of the feed. In our experiments, 2% fish oil combined with 1% lecithin in the feed matrix worked well. If excessive fines or low pellet integrity is known to occur without surface oil, the addition of an alginate-based top coating and/or extra pellet binder (like lignon sulfonate) should solve the problem.

3. The addition of 6% hydrolyzed fish protein concentrate powder should improve the palatability of the medicated ration. Higher inclusion percentages may be even more effective.
4. With the permission of a veterinarian or certified fish pathologist, the standard feeding schedule (5 consecutive days) could be altered to maximize the intake of feed containing Romet. Feeding the medicated feed on days 1, 2, 4, 6, and 8 would provide a full 5 days of Romet with the possibility of significantly greater consumption rates. General feeding activity and growth requirements would determine whether control or no feed should be given on days 3, 5, and 7. Significant rejection of Romet-containing feed on treatment days may require cessation of all feeding on the feed-optional days. Younger, faster growing fish held at warmer water temperatures may need to be fed more often. Fish maintained in cooler, slower growth conditions, or fish at later life stages, may be best served by withholding feed on the optional days.

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