

**EFFECT OF FOOD DEPRIVATION
ON BKD AND FURUNCULOSIS**

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Anorexia is a common sign of bacterial and viral diseases and is thought to be a consequence of the disease process. However, this inappetence may be an active portion of the host defense system (Murray et al. 1978, 1979). There is evidence with some bacterial fish pathogens that feed withdrawal can significantly reduce mortality (Damsgård et al., 1998; Wise and Johnson, 1998). We tested this idea by withdrawing or reducing food from juvenile chinook salmon (*Oncorhynchus tshawytscha*) during *Renibacterium salmoninarum*

(causative agent for bacteria kidney disease, BKD) and *Aeromonas salmonicida* (causative agent for furunculosis) epizootic. Fish in the BKD experiment were first purposely stressed and then fed either a full ration, half of that or fasted for six weeks (Pirhonen et al. 2000). Fish in that experiment were naturally infected with BKD. In the furunculosis experiment fish were infected by introducing five infected cohabitants into the tanks of 50 naïve fish which were either fed or fasted for one month.

At the termination of the BKD experiment, feed intake of the fish was evaluated by X-radiography after feeding all groups to complete satiation and the amount of BKD p57 antigen in the kidneys was measured by ELISA to assess effects of infection on feeding rates. Only a few individuals in each treatment died during the experiment, but the proportion of fish with detectable antigen concentration increased as ration level decreased. Within each treatment, fish with undetectable concentrations of p57 antigen ate significantly more than fish with elevated antigen levels. Exponential regressions were fitted for each ration level describing the decrease of appetite as levels of antigen concentrations increased. The data indicate that even fish that were quite sick as judged from their relatively high antigen concentrations can still feed, and that previous food deprivation can increase the feed intake to some extent in the sick fish (Pirhonen et al. 2000).

In the furunculosis experiment one month after exposure to *A. salmonicida*, disease specific mortality was low (5.0 % and 13.3 % in fed and fasted groups, respectively); there was no mortality in uninfected control fish. While few fish had detectable *A. salmonicida* in the kidney, at the termination of the experiment an average of 18.5 % and 65.0 % of the fish in fed and fasted groups, respectively, had this bacterium in or on mucus. Feed intake was measured by X-radiography at days 16 (fed groups) and 32 (all groups). Feed intake as well as growth were unaffected by exposure to bacteria. However, food consumption was greater when fasted fish exposed to *A. salmonicida* were offered a meal than in those infected individuals that had been eating. Our results suggest that during a chronic infection of furunculosis fasting would not increase immunocompetence.

These results may be relevant for application of medicated diet, as it seems possible that fasting of sick fish before administration of medicated ration could increase the probability that also sick individuals would eat.

References

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