

## Influence of natural and synthetic immunomodulators on the effectiveness of vaccines in fish

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The protection of aquatic animals against diseases by immunization has been an important concept for many years. However, some vaccines when actually applied in aquaculture are not as effective as they should be. Natural and synthetic immunomodulators activate nonspecific defence mechanisms, cell-mediated immunity and specific immune responses in fish. Immunomodulators can be administered before, with, or after vaccines to amplify the specific immune response and protection against diseases in generating elevations of humoral antibody levels and the number of antibody-secreting cells (ASC). Special applications of natural and synthetic immunomodulators include assisting spray, injection and orally to increase the topical uptake of vaccines. In the present study, the influence of two natural (HMB, Leiber-BetaS) and two synthetic (methisoprinol, levamisole) immunomodulators on the cell-mediated and humoral-mediated immune response after immunization of rainbow trout with *Yersinia ruckeri* and *Aeromonas salmonicida* vaccines were determined. The immunomodulators were administered orally in pellets before, with, or after the vaccine applied by immersion. ELISPOT and flow cytometry assays were used for the quantification of cell-mediated and humoral-mediated immune response. Also the challenge test was used for study the protection against bacterial pathogens. The percent of mortality after experimental infection were determined. The results showed that natural and synthetic immunomodulators increased the cellular and humoral immune response and protection against diseases, but results is determined by time of application before and after immunization.

### Biography

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