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Formulation and Field Evaluation of Palm Oil Adjuvanted FeedBased Streptococcosis Vaccine in Cage-Cultured Red Hybrid Tilapia

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Abstract

Author keywords

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Abstract

Streptococcosis poses a considerable threat to tilapia farming, necessitating the urgent development of an effective vaccine. Previous laboratory trials indicated the potential of palm oil as a vaccine adjuvant in a feed-based formulation. The present study further investigated the vaccine's efficacy using a similar formulation under field conditions. A total of 6.000 healthy juvenile red hybrid tilapias were divided into three groups: An unvaccinated control, a single booster group (vaccinated twice), and a double booster group (vaccinated thrice). The vaccine was administered orally at 5% of body weight. Organ samples and blood serum were collected biweekly over 16 weeks for bacterial isolation and immune response analysis, including immunoglobulin M (IgM), lysozyme, and complement C3 quantification. Serum IgM levels significantly increased ($P<0.05$) in all vaccinated groups, peaking at week 4. An additional booster given at week 6 in the double booster group resulted in sustained high IgM levels throughout the study. The isolation rates of S. agalactiae were lower in vaccinated groups, with mortality rates decreasing from 23.6% (unvaccinated) to 6.4% (double booster). These results indicate that oral administration of palm oil adjuvanted vaccine stimulates serum antibody (IgM), lysozyme, and complement C3 responses, reduces the incidence of streptococcosis, and improves the survival rate to 93.6%.

Author keywords

Oral vaccine; Streptococcosis; Streptococcus agalactiae; Tilapia; Vaccine

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References (55)

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1 Pollard, A.J., Bijker, E.M.

A guide to vaccinology: from basic principles to new developments

(2021) *Nature Reviews Immunology*, 21 (2), pp. 83-100. Cited 997 times.
http://www.nature.com/nri/index.html
doi: 10.1038/s41577-020-00479-7

View at Publisher

2 Abou-Okada, M., El-Gendy, N.M., Elhelw, R.

Effect of booster vaccination on immunoprotection in European seabass vaccinated against vibriosis

(2021) *Aquaculture Research*, 52 (2), pp. 736-748. Cited 10 times.
http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)1365-2109
doi: 10.1111/are.14930

View at Publisher