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Development Of Autogenous Vaccine Of Streptococcus Agalactiae For Hybrid Tilapia – From Isolation To The Field

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The increase in global Tilapia (Oreochromis spp.) production has occurred mainly in intensive culture systems that are characterized by high stocking densities. The high interaction between fish, constant handling practices, and in some cases, very poor water quality all lead to the incidence of infectious diseases. Streptococcus agalactiae is one of the major disease problems affecting farmed tilapia worldwide. Tilapia are highly susceptible to this disease which results in mortality over a period of around 7 days of up to 70% of the population, usually for fish that are 300-600 g in average weight. This results in a significant economic loss for farmers. Affected Tilapia commonly present with an irregular behavior associated with anorexia, exophthalmia, ascites and erratic swimming. It also causes septicemic disease, affecting organs such as the brain, kidney and gut, among others. The vaccination strategy is the most important measure for the control of streptococcosis in fish. Nevertheless, vaccine efficacy may vary due to the existence of different serotypes and the genetic profiles of circulating strains. Thus monitoring, by laboratory diagnosis, is essential to understand the prevalence of serotypes and genetic profiles existing in the country, which directly informs the relative importance of using local bacteria and development of autogenous vaccines. In this study, an autogenous vaccine for hybrid tilapia (Oreochromis niloticus x O. aurea) was developed against local species of Streptococcus agalactiae. The entire progress, from field sampling of the pathogenic bacteria until field application of the vaccine, is described. This includes the isolation and identification of the bacteria, the establishment of a seed lot system including preparation of master seed and working seed, the fermentation process, inactivation of the antigen and vaccine preparation. Six different emulsions were prepared in order to compare two different adjuvants at 3 different antigen titers. The laboratory quality control methods and residue of formalin are also presented. Safety and efficacy trials that were carried out for all 6 emulsions. Based on the efficacy results one of the preparations was selected as an autogenous vaccine for full scale production. The product was tested for onset of immunity, duration of immunity and stability. In the field, the vaccine was injected to a group of 11,500 juvenile tilapia at an average weight of 90 g, which were cultured for 4 months in an intensive pond in a commercial Tilapia farm in Israel. The fish were harvested at 535 g with improved growth performance.

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