

Modulation of Fish Allergenicity towards the Production of a Low Allergen Farmed Fish

Authors : Denise Schrama, Claudia Raposo, Pedro Rodrigues

Abstract : Background: Food allergies are conducted by a hypersensitive response of the immune system. These allergies are a global concern for the public health. Consumption of fish is increasing worldwide as it is a healthy meat with high nutritional value. Unfortunately, fish can cause adverse immune-mediate reactions, affecting part of the population with higher incidence in children. β -parvalbumin, a small, highly conserved stable, calcium or magnesium binding muscle protein is the main fish allergen. In fish-allergic patients, cross-reactivity between different fish species exist due to recognition of highly identical protein regions. Enolases, aldolases, or fish gelatin are other identified fish allergens in some fish species. With no available cure for fish allergies, clinical management is only based on an avoidance diet aiming at the total exclusion of offending food. Methods: Mediterranean fish (*S. aurata* and *D. labrax*) were fed specifically designed diets, enriched in components that target the expression or inactivation of parvalbumin (creatine and EDTA, respectively). After 90 days fish were sampled and biological tissues were excised. Proteomics was used to access fish allergens characterization and expression in muscle while IgE assays to confirm the lower allergenic potential are conducted in patients with history of fish allergies. Fish welfare and quality of flesh were established with biochemical, texture and sensorial analysis. Results: Fish welfare shows no major impact between diets. In case of creatine supplementation in *D. labrax* proteomic analysis show a slight decrease in parvalbumin expression. No accumulation of this compound was found in muscle. For EDTA supplementation in *S. aurata* IgE assay show a slight decrease in allergenicity when using sera of fish allergic patients. Conclusion: Supplementation with these two compounds seems to change slightly the allergenicity of the two mean Mediterranean species.

Keywords : fish allergies, fish nutrition, proteomics, aquaculture

Conference Title : ICMBO 2018 : International Conference on Marine Biology and Oceanography

Conference Location : Vancouver, Canada

Conference Dates : September 17-18, 2018