

## Use of Prickly Pears In Cod Fish-Burgers As Functional Ingredients

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### **Abstract**

Since the problem of the Food Waste has become a global concern, this study has the goal to make full use of the Zero-Waste concept, which is the ideal approach to find a way to recycle all the parts of any kind of food product, without producing waste. To the aim, prickly pears (*Opuntia ficus india*) were completely used as pulp and as by-products (the fruit peel is around 50% of the total product) to produce an active powder to be added as ingredient in fish burgers. As a fact, prickly pears are tropical plants, rich in polyphenolic compounds, able to control microbial proliferation and general detrimental phenomena occurring in food. For the current study, the pulp and the peel were separately dehydrated and reduced to a fine powder in order to be used as food ingredient in cod fish burgers to prevent microbial growth and improve sensory quality during storage at 4 °C. An *in vitro* test of the sole powders was also carried out against target microorganisms. After that, three different concentrations (i.e., 2.5 g, 7.5 g and 12.5 g) of peel and pulp in proper combination, were added to fish burger formulation. Results demonstrate that the addition of entire prickly pear improved microbial quality of burgers, reducing the growth of fish spoilage microorganisms (i.e., *Pseudomonas* spp., psychrotolerant and heat-labile aerobic bacteria and psychrotropic bacteria) and that 12.5 g was the best condition found of all those used. Also, the use of the prickly pears enhanced their sensory properties, thus demonstrating that this fruit could be advantageously used, without producing any waste, to prolong food shelf life, with beneficial consequences from the environmental, technological and practical points of view.