

FISH PROTEIN HYDROLYSATE

INTRODUCTION



- Fish protein hydrolysate (FPH) is a powdered product, typically cream in colour. It is produced by the use of enzymes to break down fish proteins into amino acids (proteolysis). The resultant product is highly functional, contributing whipping, gelling and texturing properties when used as an ingredient in food products.
- This method is being adopted as a major problem faced by the seafood industry is that a substantial amount of material is left behind after processing.

CONTD....



- A large proportion of the catch (~30%) is used for fish meal and animal feed because of its poor functional properties .
- One of the approaches for effective protein recovery from by-products is *enzymatic hydrolysis*.
- A large variety of different fish protein hydrolysates are being produced. The oldest is *fish sauce* which has long traditions in south-east Asia.
- Enzymatic hydrolysis is strongly preferred strictly over chemical methods for producing hydrolysates for use in nutritional applications.

DEFINITION:-



- Hydrolysates can be defined as proteins that are chemically or enzymatically broken down to peptides of varying sizes.
- FPH can be made with enzymes, acids or alkali.
- We use enzymes like pepsin and papain by controlling the temperature and duration, the degree of hydrolysis is controlled. The filtrate obtained is dried. This product is termed as Fish Protein Hydrolysate.

THE ENZYMATIC HYDROLYSIS PROCESS:-

Outline of the main steps in the production of FPH :-

Raw material

Homogenization in water

Temperature equilibration

pH adjustment

Enzyme addition

Enzyme inactivation

Cooling

Recovery of protein

Concentration/ drying

Fish protein hydrolysate

PROPERTIES OF FISH PROTEIN

HYDROLYSATES:-

Fish proteins have not only good functionality but also have a high nutritional value.

1. Roles in food systems
2. Physiological role in humans and animals
3. Role in growth and propagation
4. Role as growth media for microorganisms

1. ROLES IN FOOD SYSTEM

- FPH can be used to improve function and quality of foods.
- The solubility is between 90 and 100%.
- The soluble nature of FPH has its use as an injectable or mixable protein material to improve water binding in seafood products.
- It has been found that adding FPH from salmon to minced salmon muscle led to less drip loss on thawing compared to adding no FPH.
- One problem during the production of FPH is that bitterness can develop.

2. PHYSIOLOGICAL ROLE IN HUMANS AND ANIMALS:-

- Hydrolyzed fish material is widely used as feed for a variety of farmed animals as well as cultured food fish.
- FPH containing fish diets lead to a better nitrogen retention and have better feed conversion ratio.
- Higher the FPH the higher the feed consumption (act as a feeding stimulant) and the higher the growth.
- It makes fish more disease resistant and may stimulate the immune system of fish.
- Also stimulate the proliferation of white blood cells in human subjects.
- FPH have also been found to have a blood thinning effect, i.e increase flow of RBC.

3.ROLE IN PLANT GROWTH AND PROPAGATION :-



The amino acid and peptide profile of FPH makes it an excellent source of nitrogen for plants, and it is readily adsorbed and utilized.

4. ROLE AS GROWTH MEDIA FOR MICROORGANISMS:-

Extensively hydrolyzed FPH are an excellent growth media for a variety of microorganisms. FPH was able to stimulate the growth of lactic acid bacteria in skim milk.



THANK YOU