

**ISOLASI DAN FRAKSINASI PROTEIN DARI PRODUK SAMPING
PENGOLAHAN IKAN TENGGIRI DENGAN *SOLID PHASE
EXTRACTION (SPE)* SERTA STUDI POTENSINYA UNTUK
FORTIFIKASI MAKANAN**

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INTISARI

Telah dilakukan penelitian yang bertujuan untuk isolasi protein dari produk samping pengolahan ikan tenggiri dengan variasi kondisi larutan, yaitu melalui penambahan asam pada pH 2,50, penambahan basa pada pH 12,0 serta penggunaan surfaktan Sodium dodesil sulfat (SDS) 0,01%, fraksinasi terhadap protein terlarut menggunakan *solid phase extraction* (SPE) dan analisis komposisi asam amino esensial dalam protein menggunakan HPLC serta studi potensi protein produk samping pengolahan ikan tenggiri untuk fortifikasi makanan.

Isolasi protein dengan kondisi asam dilakukan pada pH 2,50, dengan suasana basa pada pH 12 dan menggunakan surfaktan Sodium dodesil sulfat (SDS) 0,01%. Protein terlarut yang memiliki konsentrasi terbesar difraksinasi dengan kolom SPE DSC-SCX dan larutan pengelusi buffer sitrat untuk elusi pH 3 hingga pH 5 serta buffer fosfat untuk elusi pH 6 hingga 8. Asam amino dalam setiap fraksi dianalisis menggunakan HPLC dengan detektor fluoresensi. Hasil analisis asam amino tersebut digunakan untuk studi fortifikasi berdasarkan standar FAO/WHO/UNU 1985.

Isolasi protein dengan kondisi asam pada pH 2,50 dan basa pada pH 12 masing-masing menghasilkan protein terlarut dengan konsentrasi 1,765 mg/mL dan 8,032 mg/mL, sementara dengan SDS 0,01% menghasilkan protein terlarut sebesar 9,743 mg/mL. Protein terlarut yang difraksinasi adalah protein hasil isolasi menggunakan SDS 0,01%. Fraksi protein elusi awal, fraksi pH 3, pH 4, pH 5, pH 6, pH 7, dan pH 8 masing-masing mengandung asam amino total sebanyak 12,79%, 44,26%, 43,99%, 47,97%, 7,04%, 48,92%, dan 49,18%. Konsentrasi lisin dalam setiap fraksi tersebut mengalami peningkatan seiring dengan meningkatnya pH larutan buffer pengelusi. Fraksi protein yang memiliki potensi untuk fortifikasi adalah fraksi protein pH 5, pH 7, dan pH 8.

Kata kunci: fortifikasi, fraksinasi, ikan, isolasi, protein

ISOLATION AND FRACTIONATION PROTEIN FROM THE BY-PRODUCTS OF BARRED MACKEREL FISH PROCESSING USING SOLID PHASE EXTRACTION (SPE) AND STUDY OF ITS POTENCY FOR FOOD FORTIFICATION

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ABSTRACT

The research had been done to extract protein from the by-products of barred mackerel fish processing with variations of conditions that are acid, base, and surfactant, fractionate protein using solid phase extraction and analyze the composition of amino acids using HPLC, and study potency of protein from the by-products of barred mackerel fish processing for food fortification.

Protein isolation by acid condition was done at pH 2,5, base at pH 12 and surfactant using Sodium dodecyl sulfate (SDS) 0,01%. The dissolved protein which has biggest protein concentration was fractionated using SPE DSC-SCX column with citric buffer for pH 3 to 5 and phosphate buffer for pH 6 to 8 as eluent. The amino acids of each fraction were analyzed using High Performance Liquid Chromatography (HPLC) with fluorescence detector. The result of that analysis were used for fortification study based on FAO/WHO/UNU 1985.

Protein isolation by acid at pH 2,50 and base at pH 12 have concentration of 1,765 mg/mL and 8,032 mg/mL, respectively, while extraction by SDS 0,01% is 9,743 mg/mL. The dissolved protein that was fractionated is the protein extracted using 0.01% SDS. The initial elution protein fraction and pH 3, pH 4, pH 5, pH 6, pH 7, and pH 8 fraction contains total amino acids of 12.79%, 44.26%, 43.99%, 47.97 %, 7.04%, 48.92% and 49.18%, respectively. The concentration of lysine in each of these fractions increases with increasing of pH the eluting buffer solution. Protein fractions that have potential for fortification are protein of pH 5, pH 7, and pH 8 fraction.

Keywords: extraction, fish, fortification, fractionation, protein