

EKSTRAKSI GELATIN TULANG KELINCI MENGGUNAKAN PRETREATMENT ASAM KLORIDA SERTA KARAKTERISASINYA

INTISARI

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Tulang kelinci, sebagai produk sampingan dari industri daging kelinci, merupakan sumber potensial gelatin karena mengandung kolagen. Namun, penelitian mengenai potensi tulang kelinci sebagai sumber alternatif gelatin masih terbatas. Kolagen dalam tulang kelinci terbungkus oleh material yang sangat padat berupa kristal kalsium apatit, sehingga diperlukan *pretreatment* yang efektif untuk mempermudah proses ekstraksi. Oleh karena itu, penelitian ini bertujuan untuk menentukan kondisi optimal ekstraksi gelatin dari tulang kelinci menggunakan *pretreatment* asam dengan metode *Response Surface Methodology* (RSM). *Box-Behnken Design* (BBD) digunakan untuk mengevaluasi pengaruh lama *pretreatment* (2, 4, 6 hari), lama ekstraksi (6, 9, 12 jam), dan suhu ekstraksi (50, 60, 70 °C) terhadap kekuatan gel dan *yield*. Selanjutnya dianalisis karakteristik fisikokimianya. Kondisi optimum ekstraksi gelatin tulang kelinci diperoleh dengan durasi *pretreatment* HCl selama 6 hari, waktu ekstraksi 8,79 jam, dan suhu ekstraksi 70 °C. Dalam kondisi ini, gelatin tulang kelinci yang dihasilkan memiliki kekuatan gel sebesar 281,53 bloom, dan *yield* sebesar 11,86%. Sifat fisikokimia gelatin tulang kelinci menunjukkan kandungan protein sebesar 97%, kadar abu 0,52%, kadar air 6,9%, kadar lemak 1,28%, viskositas 10,1 cP, dan pH 3,92. Karakteristik ini telah memenuhi standar GMIA. Analisis FTIR menunjukkan adanya puncak amida khas gelatin yaitu amida A, B, I, II, dan III. Profil asam amino menunjukkan glisin (20,88%) dan prolin (10,42%) sebagai unit dominan. Rantai α terdeteksi pada analisis SDS-PAGE dengan distribusi bobot molekul 75-135 kDa. Hasil penelitian ini menunjukkan bahwa tulang kelinci berpotensi sebagai sumber alternatif gelatin yang cocok untuk aplikasi di industri pangan dan non-pangan.

Kata Kunci: Asam Klorida, Ekstraksi, Optimasi, *Response Surface Methodology* Tulang Kelinci.

RABBIT BONE GELATIN EXTRACTION USING HYDROCHLORIC ACID PRETREATMENT AND ITS CHARACTERIZATION

ABSTRACT

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Rabbit bones, a by-product of the meat industry, are a potential source of gelatin because their high collagen content. There were limited studies exploring the potential of rabbit bones as an alternative gelatine source. The collagen in rabbit's bone is surrounded by very dense material in the form of calcium apatite crystals, necessitating effective pretreatment to facilitate the extraction. Therefore, this research aimed to determine the optimal conditions for rabbit bone gelatin extraction using acid pretreatment with response surface methodology. The Box-Behnken Design (BBD) was conducted to evaluate the effect of pretreatment time (2, 4, 6 days), extraction time (6, 9, 12 hours), and temperature extraction (50, 60, 70 °C) on the gel strength and yield. The physicochemical characteristics of the extracted rabbit bone gelatin were also analyzed. The optimum conditions for rabbit bone gelatin extraction were shown in 6 days of HCl pretreatment duration, 8.79 h of extraction time, and extraction temperatures of 70 °C. Under these conditions, the gel strength produced was 281.53 bloom and the yield was 11.86%. The physicochemical properties of rabbit bone gelatin demonstrated 97% protein content, 0.52% ash, 6.9% moisture, 1.28% fat, 10.1 cP viscosity, and a pH of 3.92. These characteristics comply with the GMIA standards. The distinctive A, B, I, II, and III amide peaks were found in the FTIR spectra. The amino acid profiling showed glycine (20.88%) and proline (10.42%) as dominant units. The α -chain was detected in the SDS-PAGE analysis with a molecular weight distribution of 75 – 135 kDa. This study demonstrated the potential of rabbit bones as an alternative gelatin source suitable for food and industrial applications.

Keywords: Extraction, Hydrochloric Acid, Rabbit Bone, Optimization, Response Surface Methodology.