OPTIMASI FORMULA CRYOPROTECTANT BERBASIS KARAGENAN TERHADAP KARAKTERISTIK FISIK DAN KIMIA SURIMI IKAN BETUTU (*Oxyeleotris marmorata*) SELAMA PENYIMPANAN BEKU

DINA ANRIANI
1311121047

Dosen pembimbing:

1. **Dr. Ir. Novizar Nazir, M.Si**
2. **Ismed, S.Pt, M.Sc**

FAKULTAS TEKNOLOGI PERTANIAN
UNIVERSITAS ANDALAS
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Optimasi Formula *Cryoprotectant* Berbasis Karagenan terhadap Karakteristik Fisik dan Kimia Surimi ikanBetutu (*Oxyeleotrismarmorata*) selama Penyimpanan Beku

Dina Anriani, Novizar Nazir, Ismed

ABSTRAK

Penelitian ini bertujuan untuk mengetahui pengaruh tingkat konsentrasi dari campuran *cryoprotectant* (karagenan, Kalium klorida (KCl) dan sodium tripoliposfat (STTP)) terhadap karakteristik fisik dan kimia surimi ikan betutu selama penyimpanan beku dan memperoleh formulasi campuran *cryoprotectant* (karagenan, KCl dan STTP) yang optimum terhadap sifat fisik dan kimia surimi ikan betutu selama penyimpanan beku. Penentuan formula optimum campuran *cryoprotectant* dalam pembuatan surimi ikan betutu ditentukan dengan menggunakan metode *Response Surface Methodology* (RSM) dengan faktor yang dioptimasi adalah konsentrasi karagenan, KCl dan STTP berdasarkan respon kekuatan gel, kadar air dan protein larut garam (PLG). Formula optimal yang dihasilkan dan dipilih yaitu karagenan 5,80%, KCl 0,92% dan STTP 0,17% dengan nilai *desirability* 0,769. Formula tersebut menghasilkan nilaikekuatan gel sebesar 474,05 g/cm^2, kadar air sebesar 79,42% dan kadar protein larut garam (PLG) sebesar 5,30%. Hasil pengujian fisik dan kimia surimi kombinasi *cryoprotectant* paling optimum selama penyimpanan beku 30 hari diperoleh data yaitu Analisa fisik: kekuatan gel rata-rata 458,50-472,25g/cm^2, Uji lipat rata-rata 1,2-7 dan Uji gigit rata-rata 2,8-7,2. Analisa kimia : kadar air rata-rata 77,52-80,36%, kadar protein rata-rata 15,35-19,07%, pH rata-rata 6,61-6,88, *Water Holding Capacity* (WHC) rata-rata 45,69-84,58% dan protein larut garam (PLG) rata-rata 3,06-5,14%. Analisa Mikrobiologi: angka lempeng total rata-rata 8,1 x 10^3 - 1,7 x 10^5 (CFU/gram).

Kata kunci: Ikan Betutu, Surimi, *Cryoprotectant*, dan *Response Surface Methodology* (RSM)

Mixed Optimization of Cryoprotectant-Based Carrageenan Formulation on Physical and Chemical Characteristics of Marble Goby fish (*Oxyeleotris marmorata*)Surimi during Frozen Storage

Dina Anriani, Novizar Nazir, Ismed

ABSTRACT

This research aims to determine the effect of concentration level of cryoprotectant mixture (carrageenan, potasium (KCl) and sodium tripoliphosphate (STTP)) on the physical and chemical characteristics of fish surimi during frozen storage and obtain cryoprotectant mixture formulation (carrageenan, KCl and STTP) optimum against physical and chemical properties of Marble Goby fish surimi during frozen storage. The determination of the optimum formula of cryoprotectant mixture in the manufacture of fish surimi was determined using Response Surface Methodology (RSM) with optimized factors are carrageenan, KCl and STTP concentrations based on gel strength response, water content and salt soluble protein (PLG). The optimal formula produced and selected are carragean 5.80%, KCl 0.92% and STTP 0.17% with desirability value 0,769. The formula yields gel strength value of 474.05 g/cm2, water content of 79.42% and salt soluble protein (PLG) of 5.30%. The Results of physical and chemical test of surimi most optimum cryoprotectant combination during 30 days freeze storage obtained data that physical analysis is: averagedgel strength of 458.50-472.25 g/cm2, an averaged folding test of 1.2-7 and an average teeth cutting test of 2.8 to 7.2. Chemical analysis: average water content 77.52-80.36%, average protein content 15.35-19.07%, average pH 6.61-6.88, Water Holding Capacity (WHC) average 45.69-84.58% and salt soluble protein (PLG) average 3.06-5.14%. Microbiological Analysis: total plate counts average 8.1 x 103 - 1.7 x 105 (CFU/gram).

Keywords: Marble Goby fish, Surimi, Cryoprotectant, and Response Surface Methodology (RSM)