

Intisari

PENGARUH FORTIFIKASI NANOKALSIUM TEPUNG TULANG LELE TERHADAP KARAKTERISTIK FISIK, KIMIA, DAN SENSORIS PEMPEK

Tulang ikan lele merupakan hasil samping pengolahan ikan yang kaya kalsium dan berpotensi dimanfaatkan sebagai bahan fortifikasi pangan dalam bentuk nanokalsium. Penelitian ini bertujuan untuk menentukan proses pembuatan nanokalsium tepung tulang lele, mengetahui pengaruh penambahan nanokalsium terhadap karakteristik fisik dan kimia serta mengetahui pengaruh fortifikasi nanokalsium tepung tulang lele terhadap karakteristik sensoris pempek. Penelitian menggunakan Rancangan Acak Lengkap (RAL) satu faktor dengan enam perlakuan pembuatan nanokalsium dan lima tingkat fortifikasi (0; 0,375; 0,75; 1,125; dan 1,5% b/b dari tepung tapioka), masing-masing diulang tiga kali. Metode presto pasta kalsinasi menghasilkan karakteristik nanokalsium terbaik dengan ukuran partikel rata-rata 18,32 nm, derajat putih tinggi, kadar air 0,75%, kadar lemak 0,12%, dan kadar protein 0,20%, serta kandungan kalsium dan fosfor masing-masing sebesar 308,2 mg/100g dan 181,2 mg/100g dengan rasio Ca/P 1,7:1. Fortifikasi nanokalsium berpengaruh nyata ($P < 0,05$) terhadap pH, kadar air, abu, protein, lemak, kalsium, dan fosfor. Secara sensoris, pempek fortifikasi nanokalsium memiliki karakteristik berupa aroma khas surimi, tekstur *chewiness* dan *cohesiveness*, *mouthfeel grittiness*, rasa asin dan umami, serta *aftertaste* asin, umami, dan gurih. Fortifikasi nanokalsium berpengaruh nyata terhadap kenampakan, tekstur, cita rasa, dan penerimaan keseluruhan, namun tidak berpengaruh nyata terhadap aroma. Peningkatan tingkat fortifikasi meningkatkan intensitas dan durasi sensasi *grittiness*. Berdasarkan kandungan kalsium, rasio Ca:P, dan indeks penerimaan, formulasi optimum diperoleh pada perlakuan fortifikasi nanokalsium sebesar 0,75% dengan kandungan kalsium 650 mg/100g, rasio Ca:P 1,18:1, dan indeks penerimaan sebesar 79,32%.

Kata kunci : fortifikasi, kalsium, nanokalsium, tulang lele, pempek, QDA, *time intensity*

Abstract

THE EFFECT OF NANOCALCIUM FORTIFICATION FROM CATFISH BONE MEAL ON THE PHYSICAL, CHEMICAL, AND SENSORY CHARACTERISTICS OF PEMPEK

Catfish bone is a byproduct of fish processing that is rich in calcium and has the potential to be used as a food fortification material in the form of nanocalcium. This study aims to determine the process of making nanocalcium from catfish bone meal, to determine the effect of adding nanocalcium on the physical and chemical characteristics and to determine the effect of nanocalcium fortification of catfish bone meal on the sensory characteristics of pempek. The study used a completely randomized design (CRD) with one factor with six nanocalcium production treatments and five fortification levels (0; 0,375; 0,75; 1,125; and 1,5% w/w of tapioca flour), each repeated three times. The pressure-calcination paste method produced the best nanocalcium characteristics with an average particle size of 18,32 nm, high whiteness, moisture content of 0,75%, fat content of 0,12%, and protein content of 0,20%, and calcium and phosphorus content of 308,2 mg/100g and 181,2 mg/100g, respectively, with a Ca/P ratio of 1,7:1. Nanocalcium fortification significantly affected ($P < 0,05$) pH, moisture, ash, protein, fat, calcium, and phosphorus content. Sensory evaluation nanocalcium fortified pempek had the characteristics of a distinctive surimi aroma, chewiness and cohesiveness texture, grittiness mouthfeel, salty and umami taste, and salty, umami, and savory aftertaste. Nanocalcium fortification significantly affected appearance, texture, taste, and overall acceptability, but did not significantly affect aroma. Increasing the fortification level increased the intensity and duration of the grittiness sensation. Based on the calcium content, Ca:P ratio, and acceptance index, the optimum formulation was obtained at 0,75% nanocalcium fortification treatment with 0,65% calcium content, 1,18:1 Ca:P ratio, and Acceptability Index of 79,32%.

Keywords : fortification, calcium, nanocalcium, catfish bone, pempek, QDA, time intensity