

INTISARI

Pengaruh Fortifikasi Nanokalsium Tepung Tulang Lele terhadap Karakteristik Fisik, Kimia, dan Sensoris Sosis Ikan

Penelitian ini bertujuan untuk menentukan proses pembuatan nanokalsium tepung tulang lele terbaik dan mengetahui pengaruh fortifikasi nanokalsium tepung tulang lele terhadap karakteristik fisik, kimia, dan sensoris sosis ikan. Rancangan penelitian menggunakan Rancangan Acak Lengkap Faktor Tunggal dengan optimasi pembuatan nanokalsium melalui 6 variasi perlakuan fisik yaitu Presto Kering, Presto Pasta, Presto Kering Kalsinasi, Presto Pasta Kalsinasi, Presto Kering Kalsinasi *Ball Mill*, dan Presto Pasta Kalsinasi *Ball Mill*. Perlakuan terbaik dipilih dan digunakan sebagai bahan fortifikasi pada sosis ikan dengan konsentrasi 0%; 0,375%; 0,75%; 1,125%; dan 1,5%. Hasil penelitian menunjukkan perlakuan optimasi terbaik yaitu presto pasta kalsinasi. Karakteristik fisik menunjukkan peningkatan konsentrasi nanokalsium menyebabkan struktur pori lebih kecil, padat, dan memiliki gumpalan putih. Fortifikasi nanokalsium memberikan pengaruh nyata ($p\text{-value}<0,05$) terhadap peningkatan nilai *L*, *hardness*, *resilience*, kadar air, abu, kalsium, dan fosfor, namun tidak berpengaruh nyata ($p\text{-value}>0,05$), terhadap nilai *a*, *b*, *adhesiveness*, *cohesiveness*, *springiness*, *gumminess*, *chewiness*, pH, kadar lemak, dan protein. Sosis yang dihasilkan memiliki pH 7,90-8,09%, kadar air 55,81-63,22%, lemak 1,33-2,21%, protein 10,17-15,47%, abu 2,33-4,28%, kalsium 137,11-873,89mg/100g, dan fosfor 120,28-413,72mg/100g. Hasil analisis *Quantitative Descriptive Analysis* dan *Time Intensity* menunjukkan bahwa penambahan nanokalsium meningkatkan sensasi *mouthfeel grittiness*, yang semakin kuat dan bertahan lama dalam rongga mulut. Hasil uji hedonik menunjukkan bahwa fortifikasi berpengaruh nyata ($p<0,05$) terhadap penurunan tingkat kesukaan konsumen pada atribut kenampakan, warna, aroma, tekstur, rasa, dan keseluruhan. Berdasarkan nilai indeks penerimaan dan pemenuhan klaim tinggi kalsium, perlakuan P2 (0,75%) ditetapkan sebagai formula optimal karena memiliki $AI \geq 70\%$ dan memenuhi klaim tinggi kalsium sesuai persyaratan BPOM (2019).

Kata kunci : tulang lele, nanokalsium, fortifikasi, sosis ikan, kimia, sensoris

ABSTRACT

The Effect of Nanocalcium Fortification of Catfish Bone Flour on the Physical, Chemical, and Sensory Characteristics of Fish Sausage

This study aims to determine the best process for making nanocalcium from catfish bone flour and to determine the effect of nanocalcium fortification of catfish bone flour on the physical, chemical, and sensory characteristics of fish sausages. The study design used a Single Factor Completely Randomized Design with optimization of nanocalcium production through 6 variations of physical treatments, namely Dry Pressure, Pasta Pressure, Calcined Dry Pressure, Calcined Pasta Pressure, Ball Mill Calcined Dry Pressure, and Ball Mill Calcined Pasta Pressure. The best treatment was selected and used as a fortification material in fish sausages with concentrations of 0%; 0.375%; 0.75%; 1.125%; and 1.5%. The results showed that the best optimization treatment was calcined pasta pressure. Physical characteristics showed that increasing nanocalcium concentration resulted in a smaller, denser, and white lumpy pore structure. Nanocalcium fortification had a significant effect (p -value < 0.05) on increasing L value, hardness, resilience, water content, ash, calcium, and phosphorus, but had no significant effect (p -value > 0.05), on a, b, adhesiveness, cohesiveness, springiness, gumminess, chewiness, pH, fat content, and protein. The resulting sausage had a pH of 7.90-8.09%, water content of 55.81-63.22%, fat 1.33-2.21%, protein 10.17-15.47%, ash 2.33-4.28%, calcium 137.11-873.89mg/100g, and phosphorus 120.28-413.72mg/100g. The results of the Quantitative Descriptive Analysis and Time Intensity analysis showed that the addition of nanocalcium increased the sensation of mouthfeel grittiness, which was stronger and lasted longer in the oral cavity. The results of the hedonic test showed that fortification had a significant effect ($p < 0.05$) on reducing the level of consumer preference for the attributes of appearance, color, aroma, texture, taste, and overall. Based on the acceptance index value and fulfillment of high calcium claims, treatment P2 (0.75%) was determined as the optimal formula because it had $AI \geq 70\%$ and fulfilled the high calcium claim according to BPOM requirements (2019).

Keywords: catfish bones, nanocalcium, fortification, fish sausage, chemical, sensory