EFFECT OF CALCIUM CHLORIDE AND ROTATED STARCH ADDITION ON THE GEL PROPERTIES OF SILVER CATFISH (*Pangasius sp.*) SURIMI

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Effect of calcium chloride and potato starch addition on the gel properties of silver catfish (Pangasius sp.) surimi / Liew Sheh Nee.

Lihat Sebelah

EFFECT OF CALCIUM CHLORIDE AND POTATO STARCH ADDITION ON THE GEL PROPERTIES OF SILVER CATFISH (*Pangasius sp.*) SURIMI

By
Liew Sheh Nee

Research Report submitted in partial fulfilment of the requirement
for the degree of
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DEPARTMENT OF FOOD SCIENCE
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ENDORSEMENT

The project report entitled **Effect of Calcium Chloride and Potato Starch addition on the gel properties of Silver Catfish (*Pangasius Sp.*) Surimi** by **Liew Sheh Nee**, Matric No. **UK16953** has been reviewed and corrections have been made according to the recommendations by examiners. The report is submitted to the Department of Food Science in partial fulfillment of the requirement of the degree of Bachelor of Food Science (Food Technology), Faculty of Agrotechnology and Food Science, University Malaysia Terengganu.

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DECLARATION

I hereby declare that the work on this thesis is my own except for quotations and summaries which have been duly acknowledged.

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ABSTRACT

The objective of this study is to determine the effect of $CaCl_2$ (0%, 0.2%, 0.4% and 0.6%) and potato starch (0%, 1.0%, 2.0%, 3.0%, 4.0% dan 5.0%) addition on the gel properties of silver catfish surimi. The study found that there is an interaction between $CaCl_2$ and potato starch addition. In general, increase in $CaCl_2$ concentration up to 0.4% caused increase in deformation, water holding capacity and whiteness of silver catfish surimi gel. Besides, increasing of the potato starch concentration up to 4.0% also caused increase in deformation, water holding capacity and whiteness of surimi gel. However, for breaking force and gel strength, addition of up to 0.6% $CaCl_2$ and up to 5.0% potato starch gave increased breaking force and gel strength of surimi gel. The study also shows that addition of $CaCl_2$ and potato starch above this maximum limit gave vice versa effect to the surimi gels. Addition of 0.4% $CaCl_2$ and 4.0% potato starch gave 121.05% increase in deformation, 63.21% in whiteness and 98.45% increase in water holding capacity as compared to that of control (without any additive) were shown in this study. While for breaking force and gel strength, 124.10% and 367.38% increase was obtained by addition of 0.4% $CaCl_2$ and 5.0% potato starch compared to control surimi gel. Since there is a relationship between water holding capacity and gel strength, combination of 0.4% $CaCl_2$ and 5.0% potato starch give the good yield in both water holding capacity and gel strength. In addition, microstructure observation of surimi gel shows that the gel prepared with 0.4% $CaCl_2$ and 4.0% potato starch exhibited a finer, more compact and smaller voids compared to other gel samples. This study shows that $CaCl_2$ and potato starch are potential additives to improve gelling properties of silver catfish surimi.

ABSTRAK

Objektif kajian ini adalah untuk menentukan kesan penambahan $CaCl_2$ (0%, 0.2%, 0.4% dan 0.6%) dan kanji kentang (0%, 1.0%, 2.0%, 3.0%, 4.0% dan 5.0%) ke atas sifat-sifat gel daripada surimi ikan patin. Kajian ini mendapati bahawa terdapat interaksi di antara penambahan $CaCl_2$ dan kanji kentang. Secara umum, peningkatan $CaCl_2$ pada kepekatan sehingga 0.4% menyebabkan peningkatan dalam deformasi, kapasiti memegang air dan keputihan gel surimi ikan patin. Selain itu, peningkatan kepekatan kanji kentang sehingga 4.0% juga menyebabkan peningkatan dalam deformasi, kapasiti memegang air dan keputihan gel surimi. Walau bagaimanapun, bagi daya memecah, penambahan sehingga 0.6% $CaCl_2$ dan sehingga 5.0% kanji kentang memberi peningkatan daya memecah kepada surimi gel. Kajian ini juga menunjukkan bahawa penambahan $CaCl_2$ dan kanji kentang melebihi had maksimum memberi kesan sebaliknya kepada gel surimi. Penambahan 0.4% $CaCl_2$ dan 4.0% kanji kentang memberikan peningkatan 121.05% dalam deformasi, 63.21% dalam keputihan dan meningkatkan 98.45% dalam kapasiti memegang air berbanding dengan kawalan (tanpa sebarang bahan aditif) ditunjukkan di dalam kajian ini. Sementara itu, bagi daya memecah, dan kekuatan gel, peningkatan sebanyak 124.10% dan 367.38% telah diperolehi dengan penambahan 0.4% $CaCl_2$ dan kentang 5.0% kanji berbanding dengan kawalan. Kajian ini juga menunjukkan gabungan 0.4% $CaCl_2$ dan 5.0% kanji kentang memberikan hasilan yang baik untuk kedua-dua kapasiti memegang air dan kekuatan gel. Di samping itu, pemerhatian mikrostruktur surimi gel menunjukkan bahawa gel yang disediakan dengan 0.4% $CaCl_2$ dan 4.0% kanji kentang mempunyai lompang yang lebih kecil, lebih halus dan lebih padat berbanding dengan sampel-sampel gel yang lain. Kajian ini menunjukkan bahawa $CaCl_2$ dan kanji kentang adalah bahan aditif yang berpotensi untuk memperbaiki sifat-sifat gelling surimi ikan patin.