

**EFFECT OF OZONE WASHING ON
PHYSICOCHEMICAL PROPERTIES AND
GEL STRENGTH OF SURIMI MADE
FROM AFRICAN CATFISH
*(Clarias gariepinus)***

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STRENGTH OF SURIMI MADE FROM AFRICAN
CATFISH (*Clarias gariepinus*)**

by

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A dissertation submitted in partial fulfillment of the requirements for the degree of
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DECLARATION BY AUTHOR

This dissertation is composed of my original work and contains no materials previously published or written by another person except where due reference has been made in the text. The content of my dissertation is the result of work I have carried out since the commencement of my research project and does not include a substantial part of work that has been submitted to qualify for the award of any other degree or diploma in any university or other tertiary institution.



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(NUR AISYAH MUNIRAH BINTI ABU BAKAR)

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LIST OF ABBREVIATION AND SYMBOLS

Abbreviation	Caption
GSM	Geosmin
MDA	Malondialdehyde
SEP	Salt Extractable Protein
TBARS	Thiobarbituric Acid Reactive Substance

**KESAN PENCUCIAN OZON TERHADAP SIFAT FIZIKOKIMIA DAN
KEKUATAN GEL SURIMI YANG DIBUAT DARIPADA IKAN KELI AFRIKA
(*Clarias gariepinus*)**

ABSTRAK

Ozon (O_3) merupakan bahan berkesan yang banyak digunakan dalam pembersihan dan sanitasi produk makanan dan juga membersihkan biomolekul seperti protein. Kesan rawatan ozon terhadap kandungan protein dan pengoksidaan lipid dalam surimi terbuat daripada ikan keli Afrika (*Clarias gariepinus*) dikaji dengan menilai protein yang dapat diekstrak garam (SEP), kandungan malonaldehid (TBARS), warna dan kekuatan gel surimi berbanding dengan cucian menggunakan air (kawalan). Rawatan dengan kepekatan ozon 5 ppm selama 10 min pada suhu di bawah $10\text{ }^\circ\text{C}$ menunjukkan penambahan yang ketara ($p < 0.05$) pada nilai protein yang dapat diekstrak garam (SEP) sebanyak 19.5% dan pengurangan ketara ($p < 0.05$) pada kandungan TBARS sebanyak 15.5%, mencerminkan denaturasi protein dan pengoksidaan yang lebih rendah berbanding kawalan. Keputihan surimi ditingkatkan sebanyak 2% berbanding sampel kawalan. Walau bagaimanapun, kekuatan gel surimi ikan keli Afrika yang dirawat dengan ozon lebih rendah daripada sample kawalan. Oleh itu, pencucian ozon boleh digunakan untuk membersihkan protein myofibrillar ikan keli Afrika dalam penghasilan surimi daripada ikan air tawar tetapi mesti dioptimumkan untuk menghasilkan kemampuan gel yang diinginkan.

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ABSTARCT

Ozone (O_3) is an effective substance widely used in cleaning and sanitation of food products and also purifying biomolecules like proteins. The effect of ozone treatment on protein content and lipid oxidation of African catfish (*Clarias gariepinus*) surimi were studied by evaluating the salt extractable protein (SEP), malondialdehyde content (TBARS), color and gel strength of the surimi compared to water washing (control). Treatment with 5 ppm ozone concentration for 10 min at a temperature below 10 °C significantly ($p < 0.05$) increase the value of salt extractable protein (SEP) by 19.5% and significantly reduce ($p < 0.05$) the TBARS content by 15.5%, reflecting lower protein denaturation and oxidation compared to control. The whiteness of surimi was enhanced by 2% compared to control. However, the gel strength of the surimi treated with ozone was lower than the control sample due to changes in protein structure. Hence, ozone washing can be used to purify African catfish myofibrillar proteins for the production of freshwater surimi but must be optimized for the desired gelling ability.