EFFECT OF DIFFERENT SANITIZERS ON THE MICROBIOLOGICAL QUALITY AND SENSORY ACCEPTANCE OF SANITIZED COOKED RICE

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EFFECT OF DIFFERENT SANITIZERS ON THE MICROBIOLOGICAL QUALITY AND SENSORY ACCEPTANCE OF SANITIZED COOKED RICE

By
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ENDORSEMENT

The project report entitled **Effect of Different Sanitizers on the Microbiological Quality and Sensory Acceptance of Sanitized Cooked Rice** by **Lew Kok Fang**, Matric No. **UK17059** has been reviewed and corrections have been made according to the recommendations by examiners. This report is submitted to the Department of Food Science in partial fulfilment of the requirement of the degree of Bachelor of Food Science (Food Technology), Faculty of Agrotechnology and Food Science, Universiti Malaysia Terengganu.

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DECLARATION

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

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ABSTRACT

Bacillus cereus is one of the major causes of food poisoning bacteria involved in rice and rice-based foods. It causes vomiting-type of food poisoning when more than 10^5 CFU/g presented in food. Three food-grade sanitizers were studied for their effectiveness to reduce *B. cereus* and total mesophilic bacteria without affecting sensory acceptance of sanitized cooked rice at the same time. The sanitizers used in the study were chlorine, citric acid and chlorine dioxide.. The effective concentration of chlorine, citric acid and chlorine dioxide in reducing *Bacillus cereus* and total mesophilic bacteria were 250 ppm, 0.5% and 1.0 mg/L, respectively. Inoculation of pathogenic *B. cereus* UBCC026 strain isolated from contaminated food into cooked rice was done to determine the effect of sanitizers on reducing total mesophilic bacteria and *B. cereus*. Treatment of 0.5% citric acid and 1.0 mg/L chlorine dioxide were suitable for rice sanitization because these treatments did not cause any changes of sensory characteristic of cooked rice. However, chlorine at concentration of 250 ppm was not a suitable sanitizer for rice since it showed significant ($p < 0.05$) differences in sensory attributes from control. Chlorine dioxide at concentration of 1.0 mg/L reduced at least 2.34 $\log_{10}$ CFU/g of total mesophilic bacteria and 2.64 $\log_{10}$ CFU/g of *B. cereus*. It was found that the most suitable sanitizer for rice sanitization was 1.0 mg/L chlorine dioxide because it is the most effective in reducing total mesophilic bacteria and *B. cereus* compared to other two sanitizers without affecting sensory acceptance of the cooked rice.

ABSTRAK

Bacillus cereus adalah salah satu daripada bacteria utama yang menyebabkan keracunan makanan yang terdapat dalam nasi dan makanan berasaskan nasi. Ia menyebabkan keracunan makanan berjenis muntah apabila lebih daripada 10^5 CFU/g hadir di dalam makanan. Tiga pembersih yang bergred makanan dikaji keberkesanannya dalam mengurangkan *B. cereus* dan jumlah bakteria mesofilik tanpa menjejaskan penerimaan deria nasi pada masa yang sama. Pembersih yang digunakan dalam kajian ini adalah klorin, asid sitrik dan klorin dioksida. Kepekatan yang berkesan bagi klorin, asid sitrik dan klorin dioksida dalam mengurangkan *B. cereus* dan jumlah bakteria mesofilik adalah 250 ppm, 0.5% dan 1.0 mg/L masing-masing. Inokulasi *B. cereus* UBCC026 strain yang diisolasikan daripada makanan yang dicemari ke dalam nasi masak untuk menentukan kesan pembersih dalam mengurangkan *B. cereus* dan jumlah bakteria mesofilik. Rawatan 0.5% asid sitrik dan 1.0 mg/L klorin dioksida sesuai untuk mencuci beras kerana tidak menyebabkan sebarang perubahan ciri-ciri deria nasi. Namun begitu, 250 ppm klorin bukan pembersih yang sesuai untuk beras kerana ia menunjukkan perbezaan yang signifikan ($p < 0.05$) dalam ciri-ciri deria daripada kawalan. Klorin dioksida dengan kepekatan 1.0 mg/L mengurangkan sekurang-kurangnya 2.34 $\log_{10}$ CFU/g jumlah bakteria mesofilik dan 2.64 $\log_{10}$ CFU/g *B. cereus*. Pembersih yang paling sesuai untuk nasi yang didapati ialah 1.0 mg/L klorin dioksida kerana ia adalah yang paling berkesan dalam mengurangkan jumlah bakteria mesofilik and of *B. cereus* berbanding dengan dua pembersih yang lain tanpa menjejaskan penerimaan deria nasi.