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NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

DEPARTMENT OF APPLIED BIOLOGY AND BIOCHEMISTRY

PROJECT TITLE: ENUMERATION AND
CHARACTERISATION OF STAPHYLOCOCCI
IN CREAM FILLINGS OF DOUGHNUTS.

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SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS OF BACHELOR
OF APPLIED SCIENCE (HONS) DEGREE IN APPLIED BIOLOGY AND
BIOCHEMISTRY.

PROJECT SUPERVISOR: PROFESSOR R.N. OKAGBUE.

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ABSTRACT

A total of 13 samples of cream from doughnuts were collected over a period of seven weeks and subjected to microbial analysis. Aerobic plate counts ranged from 4.1×10^4 to 2.5×10^6 cfu/g. All the cream samples contained staphylococci and the counts ranged from 3.7×10^2 to 2.8×10^4 cfu/g. The counts appeared to increase with the gradual increase in atmospheric temperatures suggesting that potentially dangerous levels of organisms may build up depending on the length of storage of the doughnuts.

Of 48 isolates of staphylococci analysed, 95.8% fermented glucose anaerobically and 60.4% fermented mannitol anaerobically. Twenty-two (45.8%) of these were coagulase positive with 41.7% being beta haemolytic. Deoxyribonuclease was produced by 83.3% of the isolates and 85.4% were found to be resistant to 5µg/ml acriflavine.

On the basis of anaerobic fermentation of glucose, deoxyribonuclease production and resistance to 5µg/ml acriflavine it was concluded that over 80% of the staphylococci were Staphylococcus aureus. Thus cream-filled doughnuts as presently prepared and sold in Bulawayo constitute a potential health hazard because of the potential of staphylococci especially S. aureus to produce enterotoxins.