EFFECT OF MANUFACTURING STEPS ON MICROORGANISMS AND TOXINS IN SOME BAKERIES PRODUCTS

By

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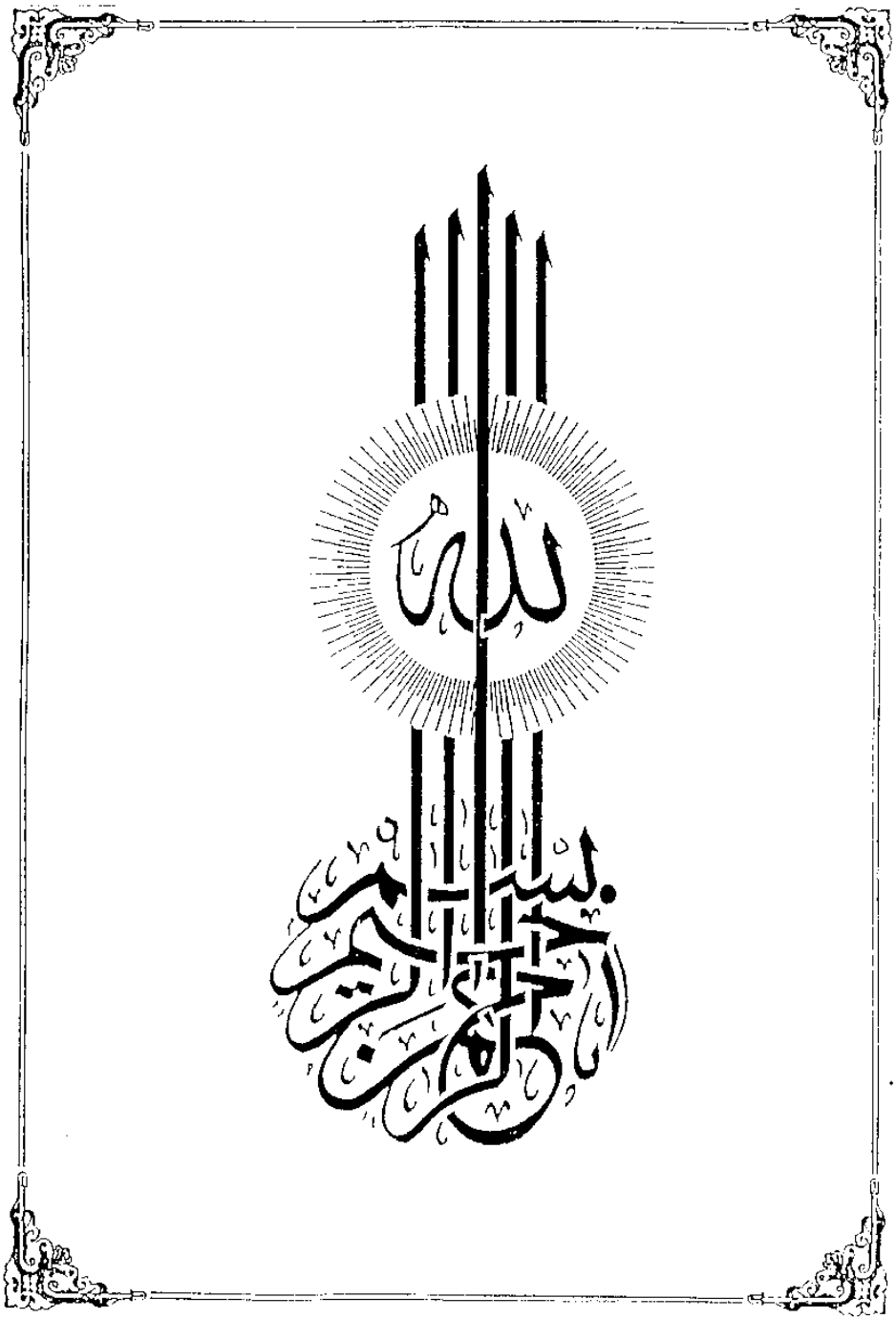

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ABSTRACT

Bisco Misr Co. produces different bakery products which are most popular in Egypt such as biscuits and bread.

To access the importance of such products as being a source of infectious diseases, certain organisms especially those of *Staph. aureus* produce enterotoxins and other microbial groups which contribute to food spoilage were studied in the ingredients from which these products are made. Besides the effect of processing steps on microorganisms, enterotoxin and

aflatoxin destruction were also investigated. The obtained results show that, strong flour harboured higher densities of total microorganisms than the soft one. Densities of spores of aerobic spore forming bacteria, coliform bacteria, yeast and fungi were found to be higher in the case of soft flour. Egg powder (II) proved to be the best one that contained low microbial density. It was also found that dried skim milk VI is microbiologically the cleanest one. Hydrogenated vegetable oils harboured very low microbial densities, low spores and fungal counts.

Microbiological analysis of glucose, sucrose and starch showed that the former (glucose) contained high densities of total microbial flora, spore counts as compared with sucrose and starch. Water however, was found to contain low densities of total microbes, spore count, yeast and fungi. Results also show that doughs of soft biscuits harboured higher microbial counts, spore densities, yeast and fungi than those detected in hard ones. Addition of sodium bicarbonate (0.57%) increased relatively total microbes and spore counts in treated doughs of both tested biscuits, yeast and fungi decreased to large extent. Effect of ammonium bicarbonate treatment showed nearly the same effect of sodium bicarbonate as regards to microbial load of tested doughs. Wafer with cream harbourd the highest densities of total microorganisms, spores and contaminated with coliform. Hard biscuits proved to be the lowest ones in containing microbes. Microbial load of different biscuits and wafer with cream considerably affected by the addition of some

chemical additives. Total microbial and spore counts in both types of hard biscuits considerably increased in the absence of sodium metabisulphite.

Storage of biscuits for 3 months at room temperature showed considerable increase in total microbial count, spores, yeast and fungi. The highest increase was recorded in wafer with cream.

Bread showed gradual increase in total microbial counts after kneading and after primary and final fermentation. Total microbial counts, yeasts and fungi gradually increased during processing of bread.

Addition of potassium sorbate during kneading decreased considerably microbial load after primary fermentation. Yeasts and fungi completely disappeared after baking whilest bacterial densities sharply dropped..

Densities of total microbes, spores, coliforms, yeasts and fungi gradually decreased after the first day of storage at 20°C (room temperature in winter). It was found that propionic acid decreased counts of yeast and fungi due to its antifungal effect. Comparing different packaging materials shows that waxed paper is the most suitable material for wrapping toast bread, while cellophane proved to be the worst material used in this respect. The effect of preservatives indicate that potassium sorbate (0.2%) is the most effective preservative against staphylococci, since it completely disappeared after such treatment. Sorbic acid (0.2%) drastically affected staphylococcal growth in cream. Propionic acid (0.2%) came