

Microbial quality and shelflife of fish based herbal sausages

By

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ABSTRACT

Fish based herbal sausage was developed by the Product Development Group of Agro and Food Technology Division of Industrial Technology Institute. The raw materials used were fresh water fish Tilapia and tuna, corn flour, vegetable fat, soy protein isolate, onion, spices (garlic, pepper, cinnamon, chilli) and herb powders (parsley, mint, coriander, celery, curry leaves)

Objectives of the study were to determine the Microbial quality of raw materials , Effectiveness of treatment of herbs with hypochlorite on microbial quality of herbal powders, Effect of heating of the sausage mixture on micro-organisms present and Shelflife of the finished product.

Ten samples of each spice and onion were analyzed for Aerobic Plate Count (APC), Yeast and Mould Count (Y&M), coliforms, faecal coliforms and *E.coli*. Ten samples of each minced fish, vegetable fat, corn flour and soy protein isolate were analyzed for the same parameters. Seven samples of each herb powder were analyzed for APC, Y&M, coliforms, faecal coliforms and *E.coli* before and after hypochlorite treatment of herbs. 08 samples of each sausage formulation were analyzed for APC, Y&M, coliforms, faecal coliforms, *E.coli*, *Staphylococcus aureus*, *Salmonella*, *Clostridium perfringens* and *C. botulinum* before and after heat treatment. Three samples of the each of the finished product were analyzed for same parameters during the 10 months storage period. Determination of APC, Y&M, coliforms, faecal coliforms, *E.coli*, *Staphylococcus aureus*, *Salmonella*, *Clostridium perfringens* and *C. botulinum* were carried out according to specifications of Sri Lanka Standard Institution.

Of the raw materials only onion, minced fish and soy protein contained coliforms and Onion contaminated with *E. coli* too. But none of the other ingredients were contaminated with *E. coli*. Of the spices pepper and chilli contained a high APC and Y&M while garlic had the lowest. The coliform count of all five herbs namely parsley, mint, curry leaves, coriander and celery exceeding 10^3 /g but the *E. coli* count were much lower ranging from 8 – 42/g. Application of hypochlorite treatment of herbs reduced the initial level of contamination of coliforms and *E. coli* but did not eliminate them completely. The APC too was reduced by hypochlorite treatment.

Microbiological study of the sausage mixture before heat treatment, showed the presence of coliforms, faecal coliforms, *E. coli*, and *Staphylococcus aureus* in all five formulations. *Salmonella* was present in formulations with parsley, coriander and celery. None of the formulations contained *Clostridium perfringens* and *C. botulinum*. Due to heat treatment all pathogens and indicators of faecal contamination were completely eliminated. APC and Y&M counts were reduced in the sausage mixture after heat treatment. During 10 months of storage of the finished products none of the pathogens and indicators of faecal contamination were detected. APC did not show a significant increase in all five types of sausages during storage. Y&M counts showed a slight increase during storage period.

The extreme variation of microbial load in spices could be due to the methods used in harvesting, drying and milling. Heavy microbial load was found in herb powders. The heaviest APC was found in coriander herbal powder and the lowest was found in mint herbal powder. It may be due to presence of anti microbial agent menthol in mint leaves. The hypochlorite

treatment used in this study was not effective in eliminating coliforms but the load of microbes was reduced. Increase of the strength of hypochlorite solution and dipping time may help to eliminating the coliforms. Heat treatment used in processing of sausages was very essential and effective in controlling microbes and specially food borne pathogens. It helps to improve the keeping quality of the finished product.

According to the results of this study no microbiological deterioration of the product occurred at -18°C during 10 months of storage.