

**Study of Sourness and other Sensory Defects causing  
Bacteria in a Meat product processing Line**

By

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## Abstract

Today nearly all sausages available in the Market are either cooked vacuum packed or uncooked vacuum packed. The present study was carried out with the view of improving the Microbiological quality of chicken sausages and improving the Good Manufacturing Practices in meat products processing plant. Commercial meat products manufacturing plant (Keells Food Products LTD) was selected to study the sourness and other sensory defects in chicken sausages, possible cause of contaminations through the process and improving the Good Manufacturing Practices in the plant.

Raw meats, uncooked chicken sausages, cooked chicken sausages and cooked vacuum packed chicken sausages from various points of the processing line and swab samples from processing equipments and places were tested to study the level of contamination. All samples were microbiologically examined for Total Viable Count, Lactic acid Bacterial count (MRS Agar count), Brochothrix count (STAA Agar count) and Enterococci count (Kanamycin Aesculin Azide Agar count).

Processing equipments and working surfaces were subjected to through cleaning and microbiological quality was assessed to detect the efficiency of cleaning. Marketed products at small retail outlets, stores of Keells sales agents and reputed supermarkets were analyzed microbiologically to determine the microbiological quality during storage of the products under marketing conditions. Cooked vacuum packed sausages stored under proper condition in the Keells factory freezer was examine microbiologically to evaluate the microbial quality during storage under prescribed conditions.

The results of the present study indicate that the different types of raw chicken meat which were used as raw materials, locally obtained meat had higher log mean viable count of bacteria than the imported meat in the frozen state. All types of chicken meat contained *Lactobacillus* and *Brochothrix* in the frozen state. In the thawed state an increased in all types of microbial counts were observed.

Raw chicken sausages had a log mean viable counts of 5.5/g and improvement of microbial counts was observed after changing the disinfectant used in the plant sanitization programme. Raw chicken sausages further contained *Lactobacillus* (mean log count 4.48/g) and *Brochothrix thermosphacta* (mean log counts 5.27). The species of *Lactobacillus* present were *L.plantarum*, *L.sake*, *L.halotolarance* and *L.alimentarius* and *Bacillus* species were *B.cerculans*, *B.lentus*, *B.badius*, *B.megaterium*, *B.pumilus* and *B.stearothermophilus*.

During processing of meat, cooking of sausages (at 72 °C for one and half hour) eliminated all *Lactobacillus* and *Brochothrix* but the total viable counts of cooked chicken sausages remained high. The surviving species after cooking belonged to *Bacillus stearothermophilus* and *Bacillus schiegelli*.

The results of the present study indicates that the products was recontaminated by lactobacillus species during process which followed. Cooked vacuum packed sausages contained a log mean total count of 4.3/g and Lactobacillus 3.95/g. *Enterococci* were not isolated in any of the sample of raw meat or in final products. During stored of vacuum packed chicken sausages from small retail outlets, stores of Keells sales agents and reputed super markets showed only *Lactobacillus* and *Bacillus* species were present in the marketed products. Therefore, it can be concluded that the sensory defects of vacuum packed sausages during storage were due to *Bacillus* and *Lactobacillus* species. The sources of contamination of *Bacillus* and *Lactobacillus* were raw chicken meat, equipments and crates used in the processing plant.

The results of the microbiological contamination of equipment before and after cleaning indicated that some of the cleaning method used were not effective in eliminating the contaminants to a satisfactory level. These included mainly the peeler machine and crates used for holding of cooked products to the packaging area. Use of Isopropyl alcohol on the tables surfaces in the packing area was very effective in the eliminating contaminants.

According to the results of the present study good manufacturing practices adopted in chicken sausages manufacturing plant were satisfactory.