World Academy of Science, Engineering and Technology
International Journal of Nutrition and Food Engineering
Vol:12, No:08, 2018

Safety Assessment of Traditional Ready-to-Eat Meat Products Vended at Retail Outlets in Kebbi and Sokoto States, Nigeria

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Abstract : Food safety is a significant and growing public health problem in the world and Nigeria as a developing country, since food-borne diseases are important contributors to the huge burden of sickness and death of humans. In Nigeria, traditional ready-to-eat meat products (RTE-MPs) like balangu, tsire, guru and dried meat products like kilishi, dambun nama, banda, were reported to be highly appreciated because of their eating qualities. The consumption of these products was considered as safe due to the treatments that are usually involved during their production process. However, during processing and handling, the products could be contaminated by pathogens that could cause food poisoning. Therefore, a hazard identification for pathogenic bacteria on some traditional RTE-MPs was conducted in Kebbi and Sokoto States, Nigeria. A total of 116 RTE-MPs (balangu-38, kilishi-39 and tsire-39) samples were obtained from retail outlets and analyzed using standard cultural microbiological procedures in general and selective enrichment media to isolate the target pathogens. A six-fold serial dilution was prepared and using the pour plating method, colonies were counted. Serial dilutions were selected based on the prepared pre-labeled Petri dishes for each sample. A volume of 10-12 ml of molten Nutrient agar cooled to 42-45°C was poured into each Petri dish and 1 ml each from dilutions of 102, 104 and 106 for every sample was respectively poured on a pre-labeled Petri plate after which colonies were counted. The isolated pathogens were identified and confirmed after series of biochemical tests. Frequencies and percentages were used to describe the presence of pathogens. The General Linear Model was used to analyze data on pathogen presence according to RTE-MPs and means were separated using the Tukey test at 0.05 confidence level. Of the 116 RTE-MPs samples collected, 35 (30.17%) samples were found to be contaminated with some tested pathogens. Prevalence results showed that Escherichia coli, salmonella and Staphylococcus aureus were present in the samples. Mean total bacterial count was 23.82×106 cfu/g. The frequency of individual pathogens isolated was; Staphylococcus aureus 18 (15.51%), Escherichia coli 12 (10.34%) and Salmonella 5 (4.31%). Also, among the RTE-MPs tested, the total bacterial counts were found to differ significantly (P < 0.05), with 1.81, 2.41 and 2.9×104 cfu/g for tsire, kilishi, and balangu, respectively. The study concluded that the presence of pathogenic bacteria in balangu could pose grave health risks to consumers, and hence, recommended good manufacturing practices in the production of balangu to improve the products’ safety.

Keywords : ready-to-eat meat products, retail outlets, public health, safety assessment
Conference Title : ICFSFSU 2018 : International Conference on Food Science, Food Security and Utilization
Conference Location : London, United Kingdom
Conference Dates : August 20-21, 2018

Open Science Index, Nutrition and Food Engineering Vol:12, No:08, 2018 publications.waset.org/abstracts/86041/pdf