



MICROBIOLOGICAL QUALITY ASSESSMENT OF STORED YAM CHIPS

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ABSTRACT

The microbiological and physico-chemical properties of yam chips (elubo) sold in four markets (IP, GM, OT & AG) in Ilorin and its environs alongside a laboratory – prepared control (CTRL) was monitored for six months. Bacterial and coliform counts were carried out on the samples at 2 weeks interval and sample AG had the highest bacterial and coliform counts which were 219.0×10^4 Cfug and 31.0×10^4 Cfug respectively while the control sample had the lowest bacterial count and zero coliform count over the storage period. A total of 5 bacteria and 11 fungi were isolated from the samples. The bacterial isolates were *Bacillus cereus*, *Bacillus subtilis*, *Erwinia carotovora*, *Escherichia coli* and *Staphylococcus aureus*, while the fungal isolates were *Acremonium sp*, *Aspergillus sp*, *A. niger*, *A. ochraceus*, *Fusarium solani*, *Mucor hiemalis*, *Mucor racemosus*, *Penicillium sp*, *Rhizopus oryzae*, *Rhizopus stolonifer* and *Syncephalastrum racemosum*. For the fungal isolates, *Rhizopus oryzae* had the highest frequency of occurrence of 24% over the storage period followed by *Mucor racemosus* with 14% frequency of occurrence while *Penicillium sp* with 3% frequency of occurrence occurred least. *Bacillus subtilis* occurred most among the bacterial isolates with 36% occurrence while *Staphylococcus aureus* with 9% occurrence had the least frequency of occurrence. Moisture content increased significantly from 14.40 to 18.80% and 17.10 to 24.96% in insect-infested samples OT and AG respectively. Crude protein and total ash reduced slightly in CTRL, IP and GM and crude protein reduced significantly in samples OT and AG up to 45% and 64% respectively. Crude fat reduced significantly up to 80% in sample AG while crude fibre and NFE reduced slightly in all samples and aflatoxin B₁ was not detected in all samples over the storage period.

Keywords: - YaYam Chipm, s, Proximate Composition, Storage, Afflation, Microbial Count.

Introduction

West Africa is the most important yam-producing regions in the world and Nigeria produces over 26.6 million metric tones of yam annually to account for over 75% of the world's production of the crop (FAO, 2005). About 20-25% of harvested yams in Nigeria and some parts of West Africa are converted into yam chips/ flour (Igbeka, 1985). Yam chips, are dried product and stores longer than yam tubers. Usually they are produced after the maturation of new yam around October and are normally stored for a year or more.

During storage, problems of mouldiness with consequent mycotoxin contamination and insect infestation are normally encountered. Kuku *et al.* (1980); Solape and Ikotun, (1988); Adisa, (1983); studied the microorganisms associated with the spoilage of yam chips. The incidence of mycotoxin (mostly aflatoxins) contamination of dried yam chips has also been studied by Bankole and Adebajo (2003); Mestres *et al.* (2003). Danjuma, (2002) also studied the effect of insect infestation on the nutrient composition of dried yam chips. The present study reported here was carried out to determine the microbial load of yam chips from 4 markets in Ilorin and its environs and to monitor the microorganisms, the proximate composition and aflatoxin B₁ content of the yam chip samples over a 6 month storage period. **Materials and methods:** Yam chip samples were obtained fro 4 markets (Ipata (IP), Ganmo (GM), Ota-tutun (OT) and Ago (AG) in Ilorin and its environs and a laboratory prepared control (CTRL) were subjected to pre-storage, storage and post-storage analyses which comprised of proximate analysis, microbial isolation and count and aflatoxin analysis. Proximate analysis and aflatoxin analysis were determined by AOAC, method (2000) and NFE was calculated by difference (Cockérel *et al.*, 1975). Bacterial and coliform counts were done according to the method described by Bell *et al.* (2005).

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