A CASE STUDY TO DEVELOP AN APPROPRIATE QUALITY ASSURANCE SYSTEM FOR TWO CASSAVA-BASED CONVENIENCE FOODS

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ABSTRACT

Over the last few years, there has been an increased interest in the production of cassava-based convenience foods for the urban markets in West Africa. Most consumers want to be assured of the quality and safety of these products. This paper reports on a case study, involving two food industries, to develop an appropriate quality assurance for two popular cassava-based convenience foods in Ghana, *fufu* and *kokonte* flour. Based on the HACCP principle, the pre-requisite programmes of the two companies were first assessed, HACCP teams were constituted, flow diagrams constructed and verified, critical control points with accompanying critical limits, monitoring procedures, corrective actions, verification procedures, record keeping and documentation procedures were established. The paper finally highlights some difficulties that potential cassava-based factories might face in using the HACCP principles to ensure safe and quality products.

INTRODUCTION

- *Fufu* and *Kokonte* flour are two popular convenience cassava-based staple foods in West Africa, produced by many small and medium-scale food industries in Ghana.
- To meet the requirements of the World Trade Organization's (WTO) sanitary and phytosanitary (SPS) agreement, a number of these food industries have taken steps to improve upon the safety and quality management systems for these two products. This case study was carried out from 2004 to 2006.

OBJECTIVE

- To develop appropriate food safety and quality assurance systems for *fufu* and *kokonte* flour produced by two Accra-based food companies, Company A and Company B, using the HACCP principles.

METHODOLOGY

- Development of the quality and safety management systems was carried out over a period of two years; sequentially as follows.
- ✓ **Baseline audits of pre-requisite programmes** (Dillon & Griffith, 1997): The pre-requisite programmes refer to state of GHPs and GMPs in the two companies. These were carried over a period of two months. A report on the non-compliances and recommendations was submitted to each company.
- ✓ **Initial steps for HACCP Implementation (Codex Alimentarius, 1997):** This activity was carried a year after the two companies have had the chance to correct most of the non-compliances identified during the baseline audit. The steps are: a HACCP team was constituted for each company, Terms of reference defined. Products and their uses were fully described.
- ✓ **HACCP Steps**: Process flow diagrams were constructed and verified on site. Potential hazards associated with each product were analyzed; critical control points (CCPs), critical limits, control measures and monitoring procedures were established.
- ✓ Types of records and documentation procedures established. HACCP teams were assisted to draw up standard operating procedures (SOPs) and internal audit scheme was instituted.

RESULTS AND DISCUSSION

Tables 1 and 2 highlight the main processing steps with CCPs, the critical limits, control measures and monitoring procedures for the two products.

Table 1: Types, sources of hazards, control measures and monitoring procedures for identified CCPs during production of cassava- plantain *fufu* flour.

Process step	Hazards & Sources	Critical Limits & Control Measures	Monitoring
Washing of raw materials CCP	V. p e.g *E. coli, Salmonella, Vibro cholerae,* Fungal spores. water from storage tank	Treat storage water with chlorine	Use of microbiological kits
Drying CCP	Pathogenic bacteria. If dryer temperature is low.	Temperature: 55 - 65°C. Keep Records on temperatures of dryer	Regular servicing of temperature monitors by accredited organization
Cleaning CCP	Spoilage & pathogenic organisms. Spent water	Clean premises, processing equipment, GHP & GMP	Visual inspection. Cleaning records

- The HACCP Implementation requires that there should be periodic sampling of the products from identified CCPs as well as from final products for microbiological and chemical analysis by an approved laboratory.
- This is especially for *kokonte* flour which from previous evidence showed the tendency to become mouldy and therefore the possibility of the presence of aflatoxins. Additional concerns are the possibility of weevils and browning of the flour.
- One major problem with the low number of food analytical laboratories in Ghana.
- The high cost of services and the slow delivery time of the few labs are major worrying factors. They are also constrained by the lack of requisite and modern equipment. Analytical chemicals are normally hard to come by.
- Also, the qualities of fabricated machines, like stainless steel slicers, dryers and milling machines used for the production of the two products are low leading to frequent breakdown.

Table 2: Types, sources of hazards, control measures and monitoring procedures for identified CCPs during production of *kokonte* flour.

Process step	Hazards & Sources	Critical Limits & Control Measures	Monitoring
Washing of raw materials CCP	V. p e.g *E. coli, Salmonella, Vibro cholerae* ,Fungal spores . water from storage tank	Treat storage water with chlorine	Use of microbiological kits
Partial Fermentation CCP	Spoilage & pathogenic organisms	Correct fermentation time Cover the fermenting chips	Cooking temperature and time, , water quality
Solar drying CCP	Aflatoxins; due to inadequate/ prolonged drying due to bad weather	……. ppm chip thickness < 7mm Temperature > 50 °C mm	Analyze for aflatoxins with kit
Cleaning CCP	Spoilage & pathogenic organisms.	Clean premises, processing equipment, GHP & GMP	Visual inspection. Cleaning records

CONCLUSIONS

This case-study has demonstrated that the food safety management system based on the HACCP principles is applicable to the production of two popular cassava-based convenience food products, *fufu* and *kokonte* flour, in Ghana. However, there are some major constraints facing the food industry in fully implementing HACCP plans on sustainable basis.

REFERENCES

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