FRI/EU CASSAVA SME's PROJECT

REPORT ON A TECHNOLOGY TRANSFER ON QUALITY ASSURANCE FOR ELSA FOODS LIMITED, KPONE-TEMA

(CSIR-FRI/RE/TC/2006/005)

BY

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2006

Summary

The Council for Scientific and Industrial Reasearch-Food Research Institute is the partner institution of the CSIR-Food Research Institute/European Union Cassava Small Scale Enterprise Project (FRI/EU Cassava SME's Project). Its overall objective was to develop selected cassava-based foods to meet the changing and growing urban demand through the production of products that are convenient, of high quality and safe for consumption. Elsa Foods Limited, Kpone, Tema was selected as a model for technology transfer under the project. This report document a two day training workshop for staff on the premises of Elsa Foods Limited on Good Manufacturing Practices (GMP), Good Personal Hygiene (GPH), Good Hygienic Practices (GHP), Good Agriculture Practices (GAP), Quality Assurance (QA) and Principles of Hazard Analysis Critical Control Points (HACCP). Its intended purpose was to ensure that products from Elsa Foods are hygienically safe and meet international standards.

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1.0 Introduction

Elsa Foods Limited was selected as a model for technology transfer under the CSIR-Food Research Institute/European Union Cassava Small Scale Enterprise Project (FRI/EU Cassava SME's Project). A major component of the FRI/EU Cassava SME's Project was the technology transfer for processing of value-added cassava products. The project among others seeks to empower cassava SME's to add value to raw cassava through appropriate processing technologies to meet the urban demands for value-added cassava products.

To address the technology transfer component of the project, Appropriate Quality Assurance System (AQAS) was developed for seven products for Elsa Foods Limited. These were cassava based products (*fufu* and *kokonte*), cassava/maize based products (*tuo zaafi*, *banku mix*) and maize/millet based products (fermented maize flour, *hausa koko* and fortified Tom Brown). The report on the AQAS is entitled ''Report on Appropriate Quality Assurance System (AQAS) for Elsa Foods: Kpone-Tema, Ghana'' by C. Tortoe, P-N. T. Johnson and C. Oduro-Yeboah of the Food Research Institute, Council for Scientific and Industrial Research. Based on the quality assurance system, a Quality Control (QC) manual was prepared for Elsa Foods Limited entitled ''Quality Manual for Elsa Foods: Kpone-Tema, Ghana'' by C. Tortoe, P-N. T. Johnson and C. Oduro- Yeboah.

In addition, a two day training workshops on Good Manufacturing Practices (GMP), Good Personal Hygiene (GPH), Good Hygienic Practices (GHP), Good Agriculture Practices (GAP), Quality Assurance (QA) and Principles of Hazard Analysis Critical Control Points (HACCP), were organised for the staff to ensure that products from Elsa Foods are hygienically safe and meet international standards.
The training was organised on the 10th and 11th April, 2006 for 6 and 8 employees, respectively on the premises of Elsa Foods Limited.

2.0 Technical staff

The technical staff that undertook the training was:

- Dr. P-N. T. Johnson — Food Post-harvest Specialist — FRI
- Dr. C. Tortoe — Microbiologist/Food Scientist — FRI
- Mrs. C. Oduro- Yeboah — Food Scientist — FRI

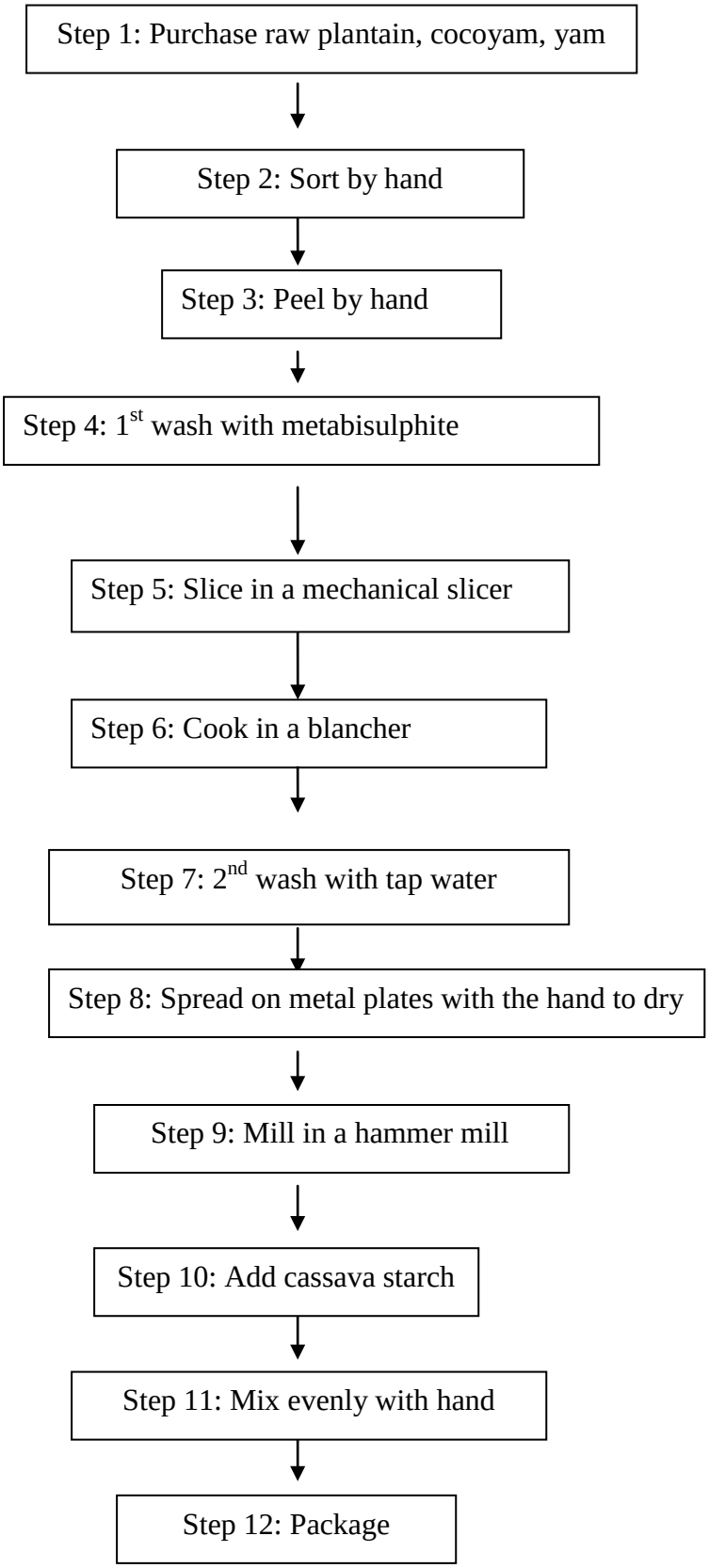
3.0 Technology transfer

On the first day of training, the purpose of the training was introduced to trainees as to ensure that products from Elsa Foods are hygienically safe and meet international standards. The Appropriate Quality Assurance System (AQAS) developed for seven products for Elsa Foods Limited was explained to the trainees. The seven products were cassava based products (*fufu* and *kokonte*), cassava/maize based products (*tuo zaafi, banku mix*) and maize/millet based products (fermented maize flour, *hausa koko* and fortified Tom Brown). The essence of the Quality Control (QC) manual was presented to the trainees as to improve on all standards of their operation from raw materials to the finished product. Trainees were taught through the Appropriate Quality Assurance System (AQAS) and the Quality Control (QC) and edged to express their views and ask questions on the Appropriate Quality Assurance System (AQAS) and the Quality Control (QC) manual as presented to them.

On the second day, an interactive training in the form of questions, answers and demonstrations on Good Manufacturing Practices (GMP), Good Personal Hygiene (GPH), Good Hygienic Practices (GHP), Good Agriculture Practices (GAP) and Quality Assurance (QA) was conducted for the trainees. The trainees were taught basic principles of food and personal hygiene and why the need for Elsa products to be safe to meet international standards. The trainees learnt Standard Operation Procedures (SOP) and Quality Assurance (QA) to ensure that raw material supply is wholesome for processing and the final product.

4.0 Training products

The processing flows of the following products were used during the training.



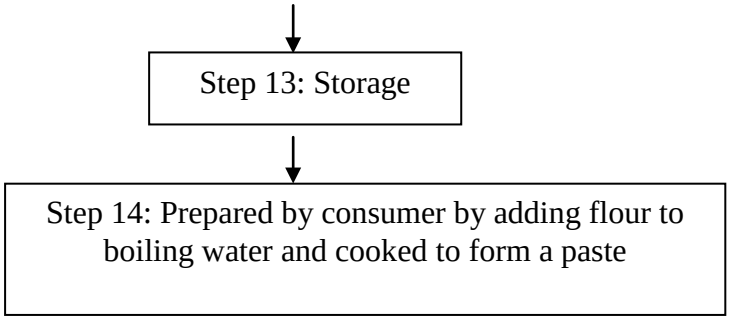
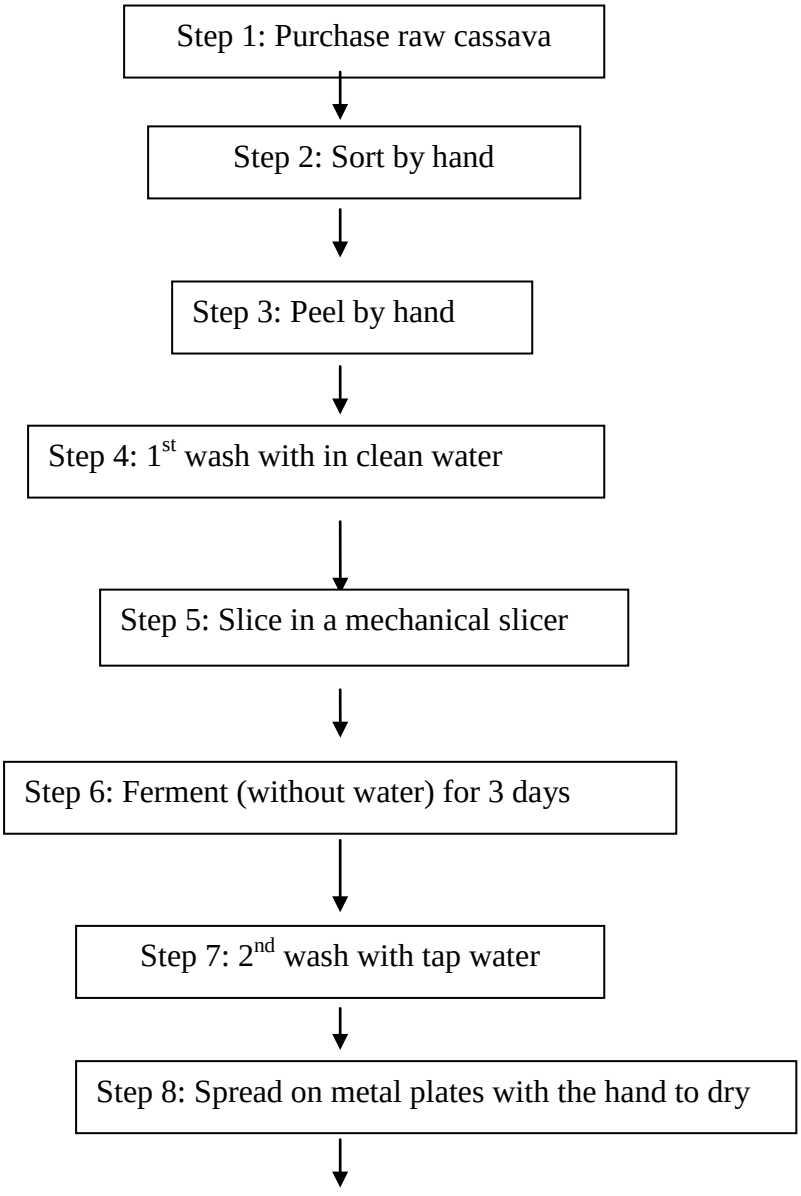


Figure 1

Process flow diagram (PFD) for the production of *fufu* flours (plantain, cocoyam and yam)



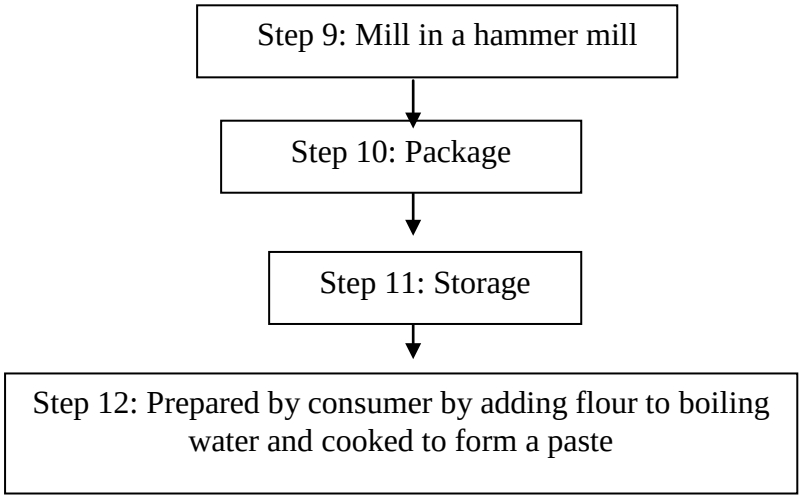
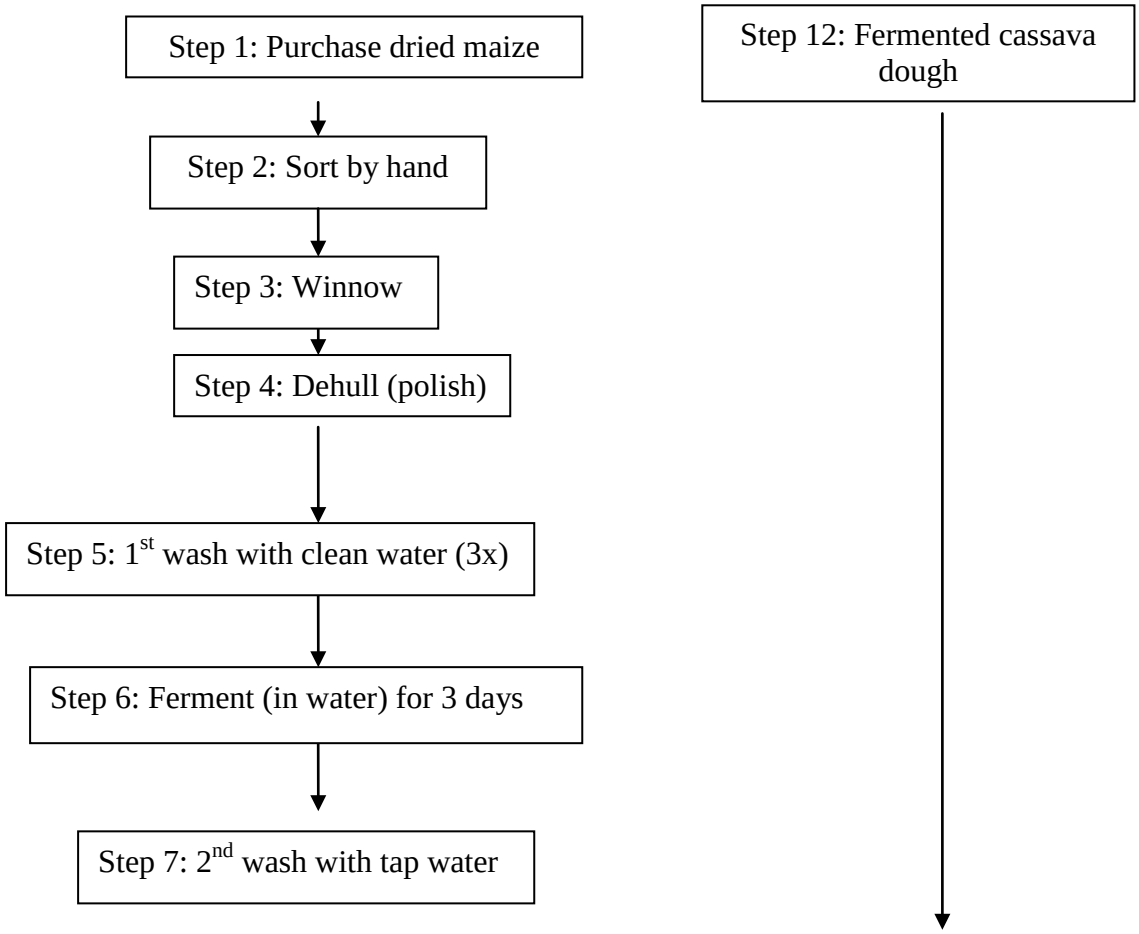


Figure 2

Process flow diagram (PFD) for the production of snow- white *kokonte*



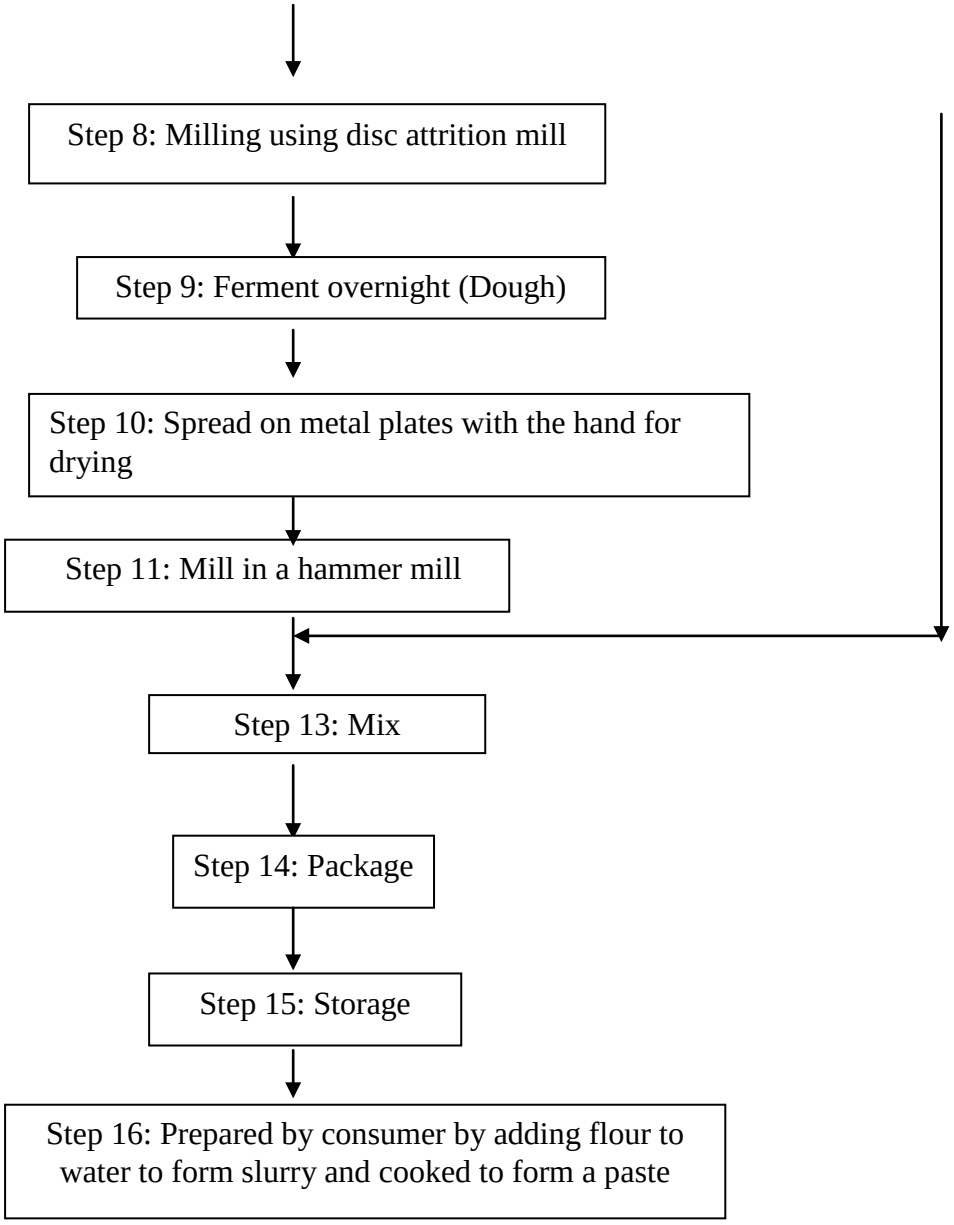
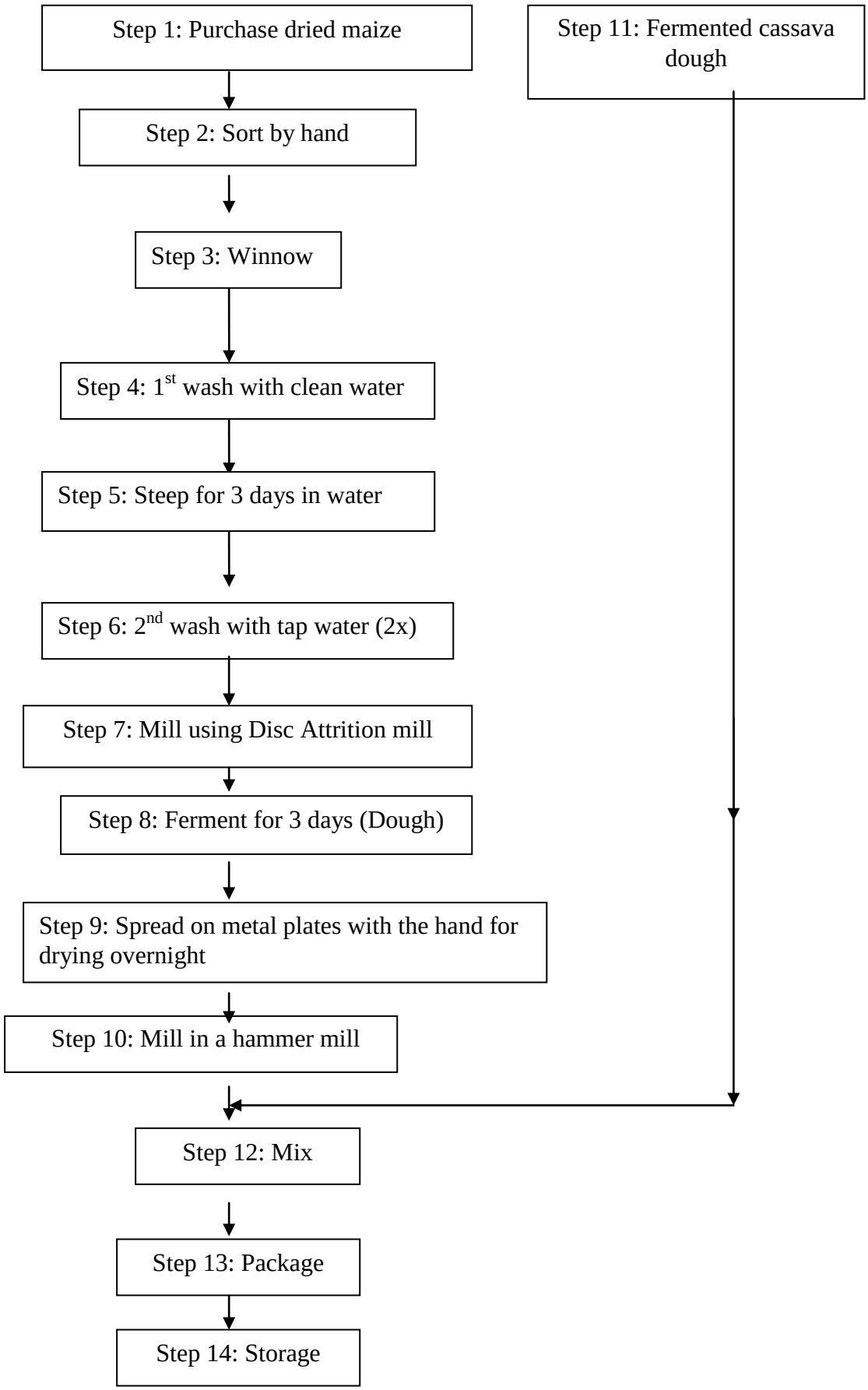


Figure 3

Process flow diagram (PFD) for the production of *Tuo zaafi*


Step 1: Purchase dried maize
Step 2: Sort by hand
Step 3: Winnow
Step 4: 1st wash with clean water
Step 5: Steep for 3 days in water
Step 6: 2nd wash with tap water (2x)
Step 7: Mill using Disc Attrition mill
Step 8: Ferment for 3 days (Dough)
Step 9: Spread on metal plates with the hand for drying overnight
Step 10: Mill in a hammer mill
Step 11: Fermented cassava dough
Step 12: Mix
Step 13: Package
Step 14: Storage

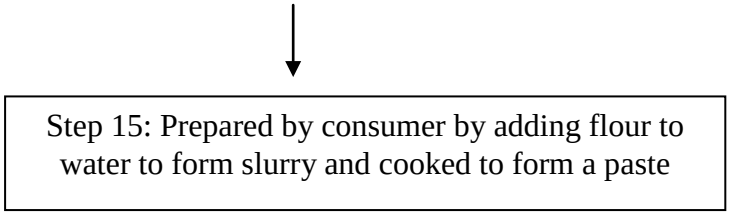
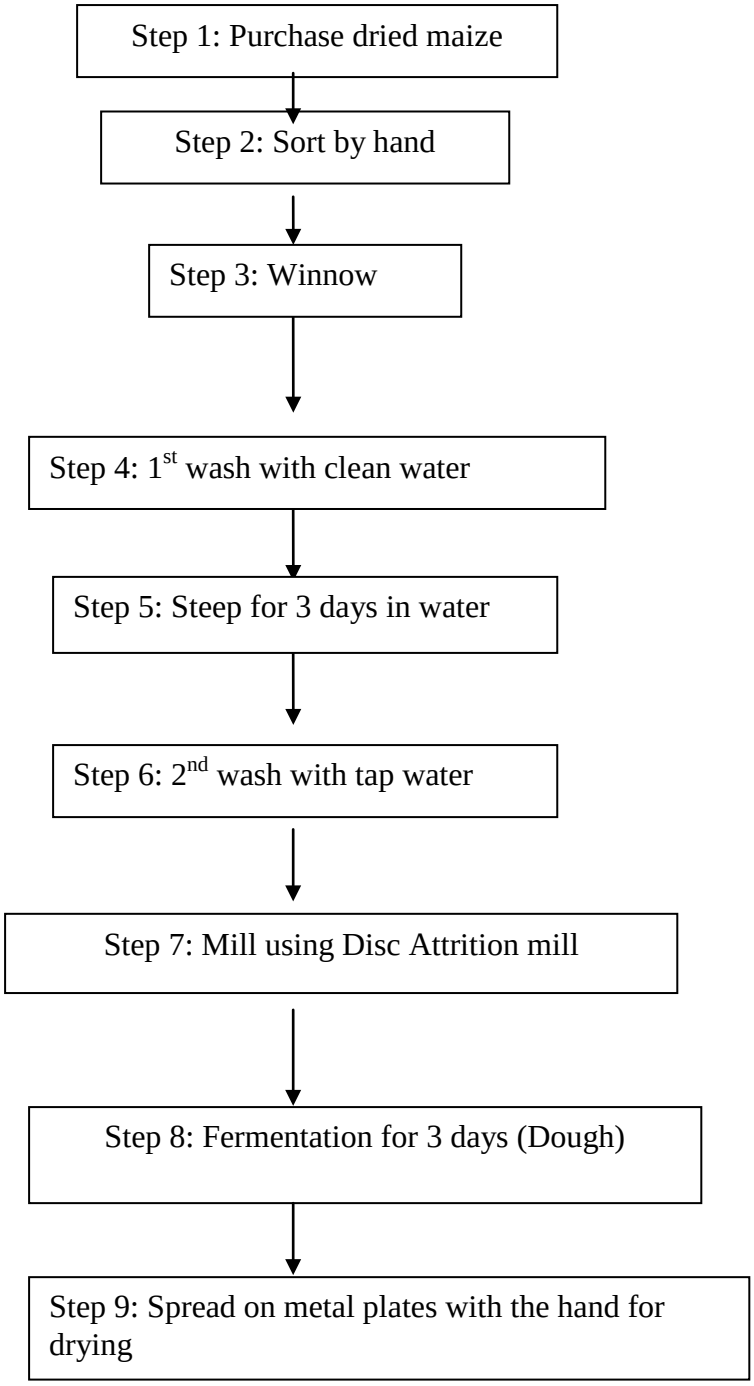


Figure 4

Process flow diagram (PFD) for the production of *banku mix*.



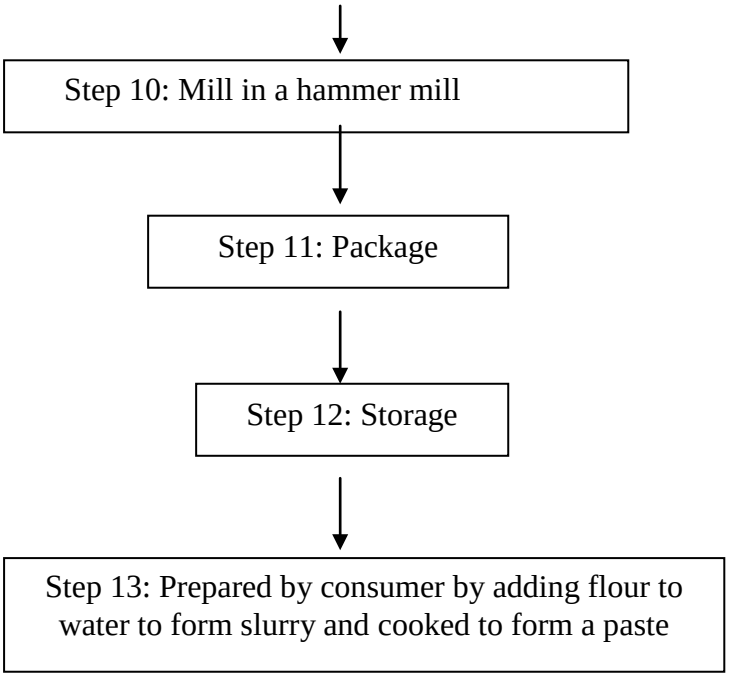
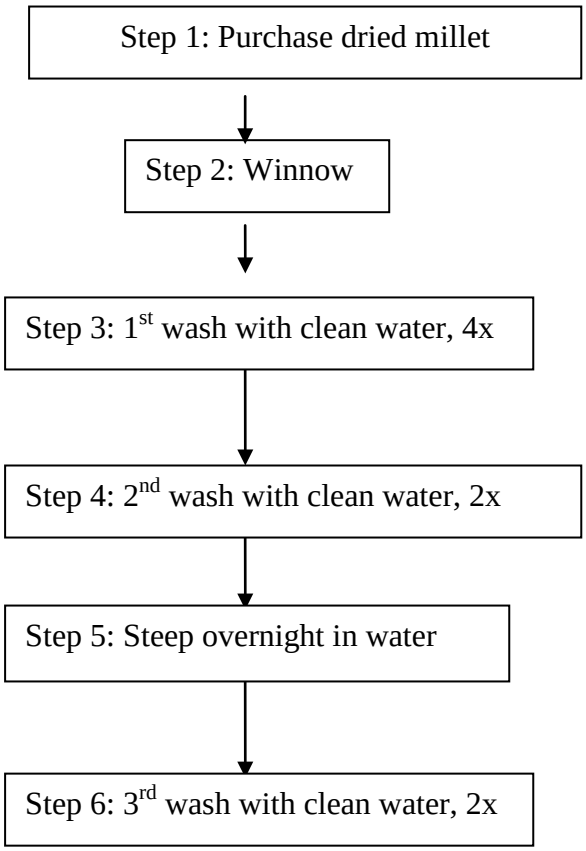


Figure 5

Process flow diagram (PFD) for the production of fermented maize meal



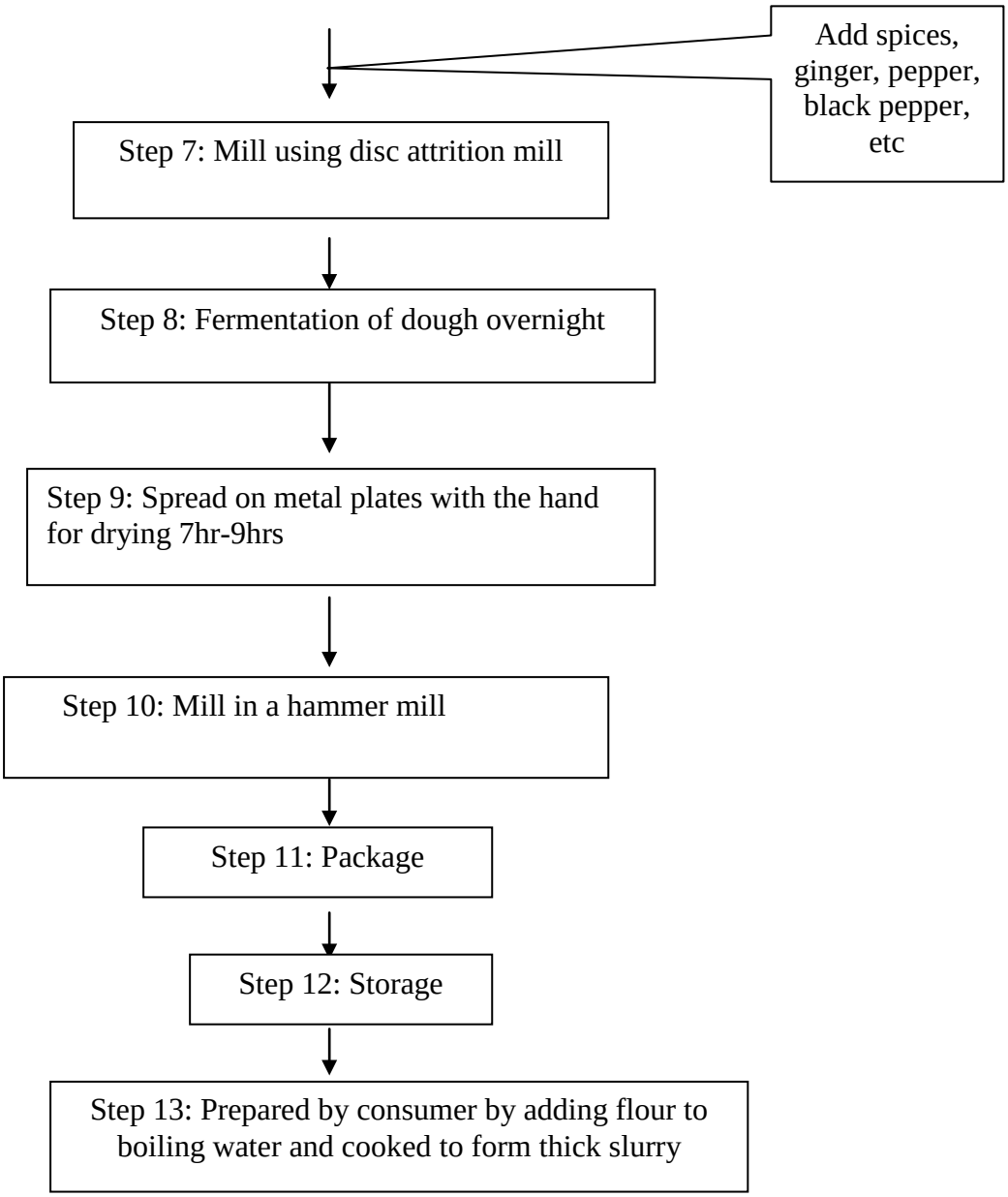
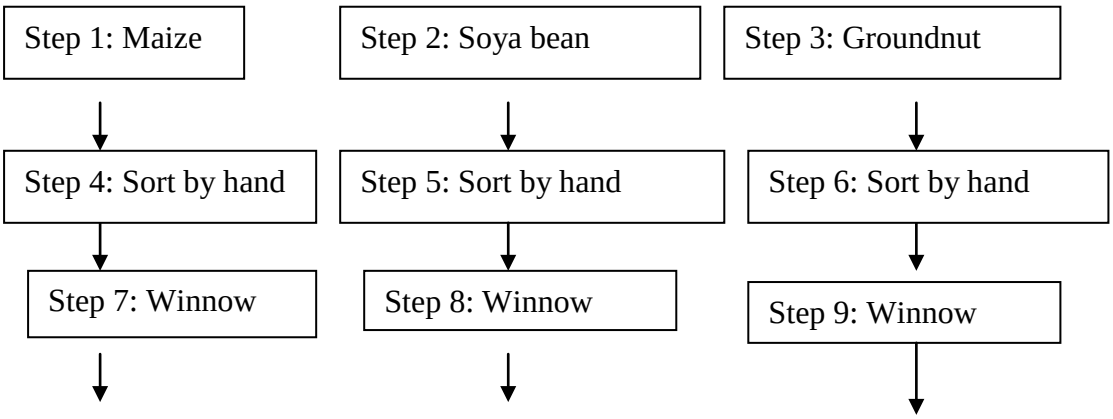


Figure 6

Process flow diagram (PFD) for the production of *Hausa koko*



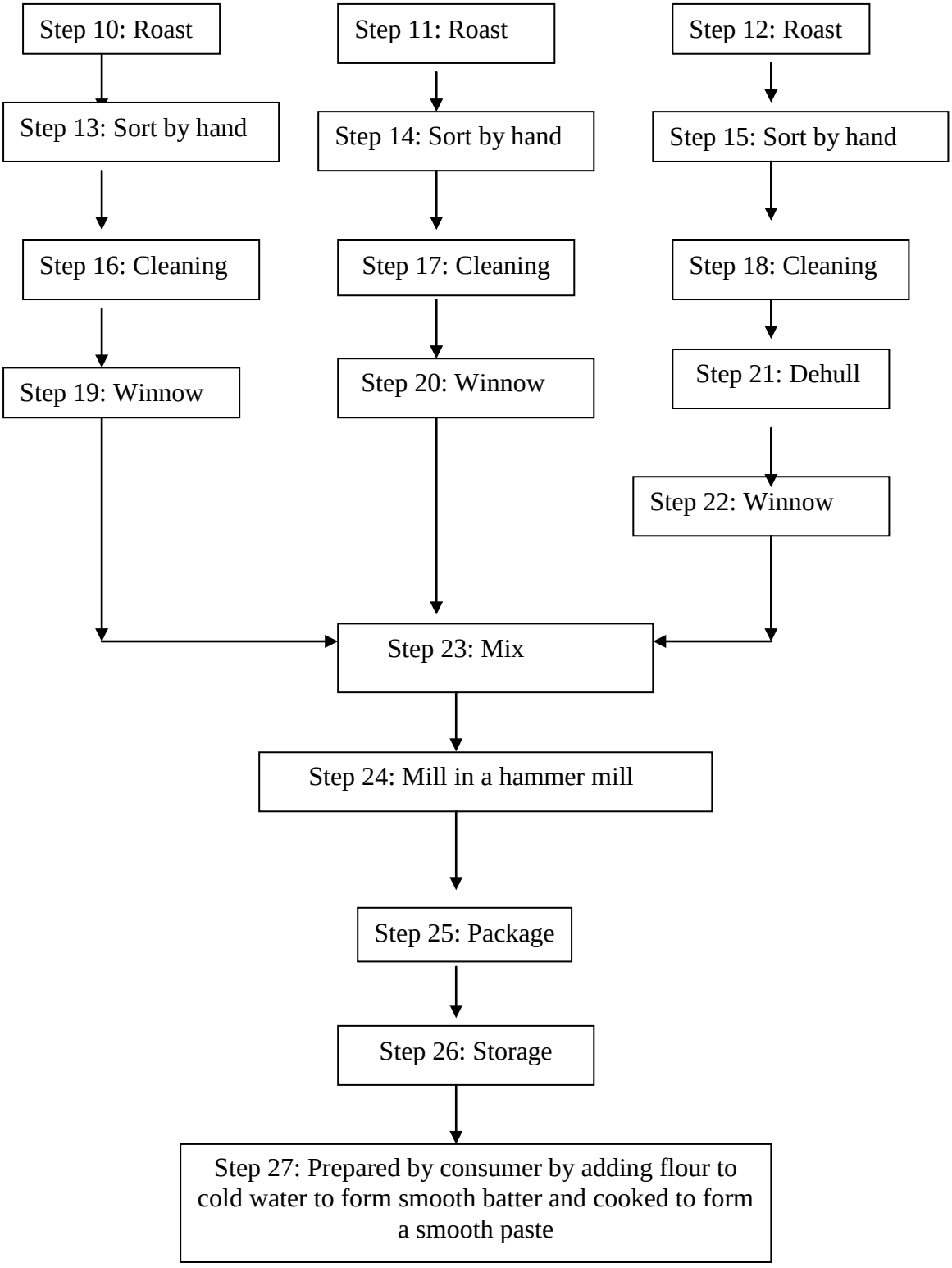


Figure 7

Process flow diagram (PFD) for the production of *fortified Tom Brown*

4.1 Handling, storage and transport

There must be procedures to sort food and food ingredient to segregate materials which are evidently unfit for human consumption. Proper method for the disposal of unwholesome material in a hygienic manner must be in place. The food and food ingredients must be properly protected from contamination form physical, chemical and biological hazards or any objectionable substances during the handling, storage and transportation. It is necessary to provide, separate, secure storage facilities for cleaning materials and hazardous substances. Food storage facilities should be appropriate to permit adequate maintenance and cleaning, avoid pest access and harbourage and enable food to be effectively protected from contamination during storage. Care should be taken to prevent, so far as reasonably practicable deterioration and spoilage through appropriate measures which may include controlling temperature, humidity, and/or other controls. Depending on the nature of the food operations undertaken, adequate facilities should be available for heating, cooling, cooking, refrigerating and freezing food, for stored refrigerated or frozen foods, monitoring food temperatures, and where necessary, controlling ambient temperatures to ensure the safety and suitability of food.

4.2 Cleaning, maintenance and personnel hygiene

All necessary cleaning and maintenance must be carried out effectively in addition to appropriate degree of personal hygiene. Surfaces and materials, in particular those in contact with food, should be non-toxic for intended use, suitably durable, and easy to maintain and clean. To achieve these, appropriate facilities and procedures should be in place for cleaning equipment, production area and containers, drainage and waste disposal, adequate water supply, wash basins and drying of hands, lavatories of appropriate hygienic design and adequate changing facilities for personnel.

4.3 Air quality and ventilation

Natural or mechanical ventilation is required to minimize air-borne contamination of food, for example, from aerosols and condensation droplets and to control ambient

temperatures, odours which might affect the suitability of food and humidity, where necessary to ensure the safety and suitability of food.

4.4 Lighting

To operate under hygienic manner, adequate natural or artificial lighting should be provided. The lighting should not be such that the resulting colour is not misleading. The intensity should be appropriate for the intended operation. The lighting fixtures should be appropriately protected to ensure that food is not contaminated by breakages.

5.0 Discussions

A trainee wanted to know the consequences if a food company do not have the Appropriate Quality Assurance System (AQAS) and the Quality Control (QC) manual. A trainee questioned if is appropriate to memories all the standard operations in the Appropriate Quality Assurance System (AQAS) and the Quality Control (QC) manual. Further questions were on how to keep the premises clean and the punishment for an unclean employee. In answering the questions, the team mentioned that a company without Appropriate Quality Assurance System (AQAS) and the Quality Control (QC) manual for its operation is contravening the international standards for operation as it is now mandatory for all food processing companies to ensure safety of their product. It is very appropriate for employees to know the standard operations in the Appropriate Quality Assurance System (AQAS) and the Quality Control (QC) manual to enhance their work. The premises and employee must always be kept clean to avoid contamination of the products. Cleanliness of the premises and employees are well presented in the Quality Control (QC) manual for Elsa Foods Limited.

Generally, the training was well conducted and trainees had the opportunity to ask various questions on GMP, GPH, GHP, GAP and QA. Trainees wanted to know how best to treat knife cuts during food processing, if it is acceptable to wear strong perfumes during operations and how often can a staff call-in sick. Trainees were

taught to treat accidents during operations in the premises as laid down in the Quality Control Manual and advised not to wear strong perfumes which can taint products during food processing. Trainees were advised to consult management to find out the company's policy on staff sickness.

6.0 Lessons learnt during the technology transfer

- Trainees were aware of the need for cleanliness at the premises.
- Trainees embraced the concepts of Good Manufacturing Practices (GMP), Good Personal Hygiene (GPH), Good Hygienic Practices (GHP), Good Agriculture Practices (GAP) and Quality Assurance (QA).
- Trainees were very appreciative of the training received.

7.0 Conclusion

The trainees were aware of some of the basic principles of food and personal hygiene and why the need for Elsa products to be safe to meet international standards. The trainees were very appreciative of the training in that, they have learnt a lot hitherto unknown to them, which will improve their processing activities.

8.0 Recommendation

It is recommended that follow-ups on training at Elsa Foods Limited be conducted to access impart of the training and recommend improvement.

Glossary

FRI…….....Food Research Institute
EU……European Union
SMEs……Small and Medium Scale Enterprises
SOP……..Standard Process Flow
QA…….....Quality Assurance
HACCP……Hazard Analysis Critical Control Point
CCPs……Critical Control Points
PFD……..Process Flow Diagram
SOP……..Standard Operating Procedures
GAP…….Good Agriculture Practices
GMP…….Good Manufacture Practices
GPH…….....Good Personal Hygiene
GHP…….....Good Hygienic Practices
AQAS……...Appropriate Quality Assurance System
QC……Quality Control