

CSIR-FOOD RESEARCH INSTITUTE



CSIR-FRI/PAYDP

**REPORT ON THE TRAINING OF HEAD PORTERS FROM ACCRA AND KUMASI
ON PRODUCTION AND UTILIZATION OF ROOT AND TUBER FLOURS, CEREAL
MIX AND SOYBEAN POWDER**



CONDUCTED AT CSIR-FOOD RESEARCH INSTITUTE, ACCRA (December, 2017)

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December, 2017

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ACRONYMS

CSIR – Council for Scientific and Industrial Research

FRI – Food Research Institute

HQCF – High Quality Cassava Flour

PAYDP – Purim African Youth Development Program (PAYDP)

NGO – Non Governmental Organization

UNFPA – United Nations Population Fund

SUMMARY

The PAYDP is an NGO that has a vision to improve the welfare of vulnerable street girls such as head porters. The NGO's hopes to empower this vulnerable group in society through legal literacy, livelihood skills training, adolescent and sexual reproductive health education and human rights advocacy . As part of their livelihood enhancement activities, a training was held at CSIR-Food Research Institute for 20 Head Porters selected by the NGO from Accra and Kumasi. The aim of the training was to endow head porters with the skill in processing and utilizing HQCF, cocoyam and sweetpotato flour for bakery applications, and production of cereal mix and soybean flour. The training was largely hands-on and practical, in which all trainees actively participated. The trainees were taught the details of each unit operation involved in processing winimix from local cereals and flours from root crops such as cassava, green plantain, cocoyam and sweetpotato. They were also given an expose on food safety in food processing. The participants expressed much appreciation at having taken part in the training program because they acquired skill set and practical knowledge required to process winimix, soybean powder, flours from root crops and pastries made from these flours.

1.0 Introduction

PayDP is an NGO that focuses on improving the welfare of vulnerable street girls. The NGO has rolled out a program to train and empowering head porters. The program is aimed at equipping young head porters between the ages of 10-19 years with tools that will help them make informed decisions over their future and improve their livelihood and reduce their vulnerability to gender-based violence. This would be achieved through legal literacy, livelihood skills training, adolescent and sexual reproductive health education and human rights advocacy. The program, which is targeting some urban market centers within Ashanti, Brong Ahafo and Greater Accra regions, is expected to benefit about 2,200 head porters.

Under the skill development component of the NGO's program, head porters were to undergo training in agro processing in order for them take up the processing of some dry food products to enhance their livelihood. As part of this, a training on the processing of root crops into flours and utilization in the production of bakery products, production of winimix and soybean powder was scheduled for the head porters. The training was to equip them with employable skills and also create employment opportunities for improving income levels and their livelihoods. The ultimate goal of the training was to provide a better alternative to their current trade. This report presents the events and activities under the 5 day training program, which was facilitated by Researchers and Technologists at CSIR-Food Research Institute.

1.1 Objective

To endow head porters with the skill in processing and utilizing HQCF, cocoyam and sweetpotato flour for bakery applications, and production of cereal mix and soybean flour.

1.2 Welcome Address

Dr. Charlotte Oduro-Yeboah welcomed the team from PAYDP and participants of the Orange Girls Network to CSIR-Food Research Institute. She indicated that the CSIR-Food Research Institute is one of the thirteen Institutes of the CSIR, and as part of its mandate, supports the local food processing industries through activities such as training. She informed participants that the Institute also provides technical and analytical services to entrepreneurs in the food processing industries. She admonished participants to take the training seriously so that, with the skills acquired, they will be able to create business avenues to provide income and better their lives.

1.2 Opening remarks

In her opening remarks, Mrs. Aku Xornam Kevi, the Executive Director of PAYDP said the training is a part of the provision of integrated legal literacy, livelihood skill training and adolescent sexual and reproductive health and rights services for female head porters in selected urban markets in three regions in Ghana. She said this forms part of efforts to empower this vulnerable group of women and help end child marriage in Ghana. She argued that investing in these girls and giving the employable skills in areas such as food processing can lead them into better businesses which will ensuring that have a better life and reduce their vulnerability to gender-based violence.

She challenged the trainees to take keen interest and apply themselves to the training in order to pick up the skills involved in processing composite flours and utilizing them in pastries production. She was optimistic that when they are able to go through the training successfully, they will acquire the skills need to establish a business, with support for the NGO.

1.3 Participants

Twenty head porters (Kayayee) from Accra and Kumasi who belong to the Orange Girls Network, a group created by PAYDE, were selected for the training.

2.0 Processing flour from root and tuber crops

The trainees were briefed about the nutritional and economic importance of tuber crops and how to add value and generate income from these crops through processing. The importance of drying and the type of drying systems available for producing flour from these local crops were also mentioned. Participants were also taught the factors that influence drying and the final quality of flour produced.

2.1 Basic operations food processing

Participants were given a general overview of the unit operations involved in processing winimix from local cereals and also flours from root and tubers. These steps ought to be carefully followed so that good quality products are obtained at the end of processing. After the general overview, the details of these unit operations were explained further and demonstrated during the practical session. The trainees were also advised to observe hygiene and safety food processing precautions to ensure that the final product is safe for human consumption.

2.1.1 Raw material selection

Root and tuber crops used for making flour, or cereals for processing winimix must be of good quality since this directly affects the outcome of the final product. They were taught to use healthy and mature crops. This would ensure that the flour produced in the end would have good properties such as attractive color and appearance. The participants were advised not to use diseased, rotten or unwholesome raw materials for production. They were taken through the rudiments of sorting to ensure that good quality raw materials are selected for processing.

2.1.2 Raw material preparation

The participants were given a practical demonstration of washing and peeling green plantain, cocoyam, sweetpotato and cassava. Washing is an important step in food processing. This process cleans the raw material and significantly reduces microbial load. Washing also reduces agro chemical residues on the raw produce. After washing, the tubers may be peeled and sliced manually with sharp stainless steel knives or automatically with a peeler and slicer. Trainees were shown the need to have thin and evenly-shaped slices. This would enhance moisture removal and also ensure that slices dry uniformly.

2.1.3 Drying

Drying is the most important operation in this training program because the product quality is heavily dependent on this process. The participants were taken through the details of drying using a solar dryer or an electricity-powered cabinet dryer. After slicing and evenly spreading on drying trays, the trays are arranged carefully in the dryer. Drying temperatures range between 60 to 65 °C. After drying the slices are cooled at room temperature before milling into fine powder and packaging.

2.1.4 Packaging

The staff were given a general overview of packaging before its importance in relation to keeping the flours was discussed. Flours are mostly packaged in cotton sacks or clear flexible polyethylene or polypropylene pouches and sealed to exclude air and moisture. Winimix, soybean powder and the pastry products may also be packaged in polyethylene or polypropylene bags. They were advised to take

packaging seriously because it is the only means by which the integrity of the product could be maintained after processing.

2.3 Food Safety

Issues concerning safe food have become a global phenomenon because of several reported outbreaks of food borne diseases worldwide. Food safety is necessary to safeguard the health of consumers by preventing illnesses attributed to food consumption. The *kayayees* were taught the importance good manufacturing practices, including cleanliness. They were cautioned to observe good personal hygiene at all times.

3.0 Practical demonstration

The practical demonstration was in three sessions; production of flour from tuber crops, utilization of flours in pastries production and production of cereal mix and soybean flour. Cassava, sweetpotato, green plantain and cocoyam were used in the practical demonstration on root and tuber flour production. The raw materials used in the training were purchased from the Agbogbloshie market in Accra. All the 20 participants took active part in the practical demonstration.

Production of root and tuber flours

After sorting and cleaning, the crops were also washed in potable water peeling, cutting and slicing. The thin slices from each crop was dried separately. These were spread thinly and evenly on drying trays before loading into the mechanical dryer. In the case of HQCF however, after peeling the cassava was grated into a wet mash and pressed using a mechanical screw press. The resulting solid cake was disintegrated and spread thinly on the drying trays for drying. After drying, the slices or granules (in the cassava) were cooled to room temperature before milling into flour. The flour from each crop was separately packaged into flexible polypropylene pouches and sealed.



Trainees peeling green plantain and cassava



Participants spreading sliced green plantain and grated cassava

Utilization of flours in pastry production

In this practical session flours produced from the root crops were made into composite with wheat flour and used for making pastries such as biscuits, doughnuts and cupcakes. The *kayayees* were first taught the basics of formulating composite flours from wheat flour and tuber flour. Subsequently, they were taught how to use the flours for making the pastries. Metric measurements (gram and kilogram) used in flour formulation were related to the weights and handy measures such as cups, spoons and *olonka* which most of the trainees are familiar with. This approach was used in order for participants to appreciate and understand standard methods.





Trainees actively engaged in bakery activities

4.0 Observations and general remarks

The training was successful and participants appreciated the hands-on mode adopted. They all took active part and were keen on learning more. They showed enthusiasm and observed the basic rules of safety and hygiene during processing.

5.0 Conclusions and recommendations

The training was successfully carried out and participants learnt the basic operations in processing and utilization of root and tuber flours in making pastries. Based on the training and general observations made, the following recommendations were suggested

- A shed should be erected over the dryer to keep it from direct contact with rain.
- Although they have food safety measures in place there is the need to develop and implement an HACCP in the processing facility.
- Support the company through technical backstopping

6.0 Closing remarks and presentation of certificates

Dr. Charlotte Oduro-Yeboah congratulated the participants for making time to attend the training program and asked them to practice what they have learnt. She advised the participants to create businesses out of the training they have acquired to improve their livelihood and economic status. This, she said would give them a better life which is less risky compared to their current trade which exposed them to many dangers. On her part, the Executive Director of PAYDP, Mrs. Aku Xornam Kevi extended a word of appreciation to CSIR-FRI for training members of the Orange Girls Network.



Closing remarks by Dr. Oduro-Yeboah and Mrs. Aku Kevi



Presentation of certificates

After the closing remarks, Dr. Oduro-Yeboah presented a certificate to each member of the group for successfully participating in the five-day training program.