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**REPORT OF TRAINING WORKSHOP ON PROCESSING OF  
FRUITS INTO JUICES, DRINKS AND CONCENTRATES FOR  
LOCAL FOOD PROCESSING ENTREPRENEURS**

by

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## Summary

A 5-day training workshop on processing of fruits into juices, drinks and concentrates was organised by the Food Research Institute (FRI) of the Council for Scientific and Industrial Research (CSIR) for local food processing entrepreneurs from the 16<sup>th</sup> to 20<sup>th</sup> of July 2001. The workshop, which attracted 36 participants of varied background, was aimed at providing participants with some basic information on the underlying principles, methods and techniques involved in the production of high quality fruit juices, drinks and concentrates. It was also participatory and therefore it demonstrated appropriate methods and techniques involved in the production of these fruit products. Participants produced pineapple and orange juices, drinks, jam and marmalade during their practical sessions. Most participants expressed satisfaction with the workshop and called for more of such training workshops. The FRI made a net profit of ¢16.25m.

## **1. Introduction**

As part of efforts of the Food Research Institute to commercialize its activities, a 5-day training workshop on processing of fruits into juices, drinks and concentrates was organised for the first time in several years for local food processing entrepreneurs from the 16<sup>th</sup> to the 20<sup>th</sup> of July 2001. The course was run by a multi-disciplinary team of food scientists, technologies and engineers drawn from the various divisions and units of the FRI. This is a short report on the training workshop. It also captures some of the pictures of participants during the practical sessions in the main processing hall of the FRI.

## **2. Course Objectives & Contents**

The course objectives were:

- i. To provide some basic information on the underlying principles, methods and techniques involved in the production of high quality fruit juices, drinks and concentrates.
- ii. To demonstrate appropriate methods and techniques involved in the production of fruit juices, drinks and concentrates.
- iii. To create the awareness to the local food processing entrepreneurs that the FRI can assist them produce high quality fruit juices, drinks and concentrates both for the local and export markets.

The course content were on the following:

- Procurement of fresh fruits for processing
- Pre-washing and storage of fruits
- Preparations for processing: grading, washing, processing equipment etc
- Juice extraction
- Product modification: soluble solids and acidification
- Microbiology of fruit processing: pasteurisation
- Preservatives and other additives
- Types of fruit juices, drinks and concentrates
- Aseptic packaging
- Quality assurance: HACCP, TQM



- Shelf-life
- Juice and drinks from concentrated juice
- Plant design and location for fruits processing factory
- Management of processing operations I: Throughput & Timing Of Operations
- Managements of processing operations: Repairs and Maintenance
- Management of processing operations: Costing of project and product business expansion

### **3. Participation**

The course duration was five days and was well attended by a cross-section of people, thirty-six participants in all (20 women and 16 men). There were participants who already were working with fruits companies. There were also people who were about to go or have just gone on pension and who were contemplating going into fruit processing industry. Finally, there were young graduates fresh from school.

There an initial two days of theory work during which the participants were taken through the fundamental topics related to fruit processing. This was followed by two days of practical sessions. The participants were divided up into two groups to process the fruits; one group for production of fruit juices and drinks and the second group for concentrates for first day. These groups interchanged on the second day. Appendix 1 contains some of scenes during the practical sessions.

Having had the benefits of the practical sessions, the participants were then taken through other issues related to the establishments of a fruit processing company. These included topics like factory layout, business operations, maintenance and management of processing operations. At the end of the training, evaluation forms (Appendix 2) were distributed to participants for them to comment on the training workshop. The Director of the Food Research Institute distributed certificates of participations to the participants. A copy of the certificate is given in Appendix 3.

#### **4. Revenue to the FRI**

Each participants paid ₦600,000. For the 36 participants therefore, the gross income to the FRI amounted to ₦21.6m. After deducting all the necessary expenditure, the net profit that accrued to the FRI was ₦16.25m.

#### **5. Conclusion**

The training workshop was successfully carried out. And judging by the comments made by participants, both verbally and on their evaluation forms, there was a general feeling of satisfaction with the way the workshop was organised. The profit gained by the FRI could have been higher, had it not been the fact a number of essential items had to be bought for the first time for this particular workshop. This was so because of the fact such a workshop had not been organised for a long time by the Institute.

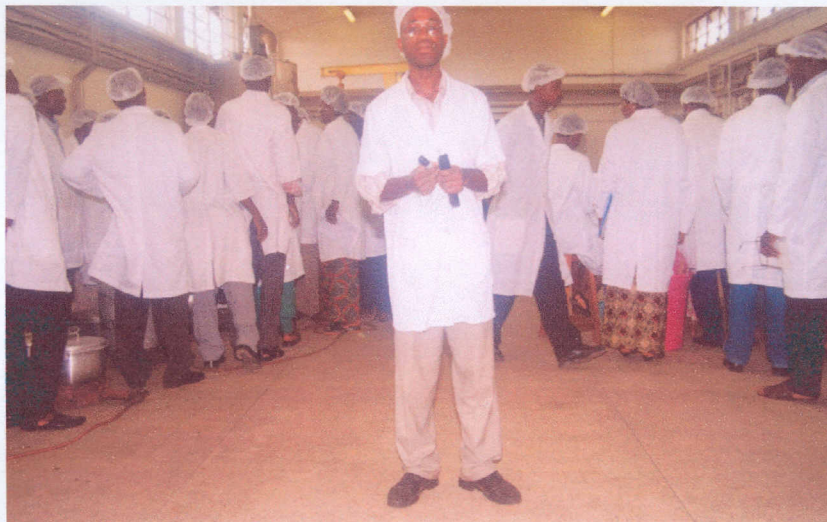


**APPENDIX 1: PICTURES OF PARTICIPANTS DURING THE PRACTICAL SESSIONS**

**GROUP PHOTOGRAPH OF PARTICIPANTS AND FACILITATORS OF THE FIRST TRAINING WORKSHOP ON PROCESSING OF FRUITS INTO JUICES, DRINKS AND CONCENTRATES FOR LOCAL FOOD PROCESSING ENTREPRENEURS, JULY, 2001**



**PARTICIPANTS AT THE WET PROCESSING HALL OF THE PILOT PLANT OF THE FOOD RESEARCH INSTITUTE FOR THE DEMONSTRATION ON PROCESSING OF FRUITS INTO JUICE, DRINKS AND CONCENTRATES**





**PARTICIPANTS LISTENING TO INTRODUCTORY REMARKS BY FACILITATOR BEFORE THE DEMONSTRATION**



**PARTICIPANTS LISTENING ATTENTIVELY AND TAKING NOTES**



**PARTICIPANTS FILTERING OUT EXTRACTED PINEAPPLE JUICE**



**A PARTICIPANT MEASURING THE SUGAR CONTENT OF EXTRACTED (I.E BRIX) USING A HAND-HELD REFRACTOMETER**





**A FACILITATOR EXPLAINS A POINT TO THE PARTICIPANTS**



**A PARTICIPANT WEIGHING, PEELING AND CUTTING ORANGES**



## CONCENTRATION AND PASTEURISATION OF JUICE



**A PARTICIPANT STIRRING THE EXTRACTED JUICE TO CONCENTRATE AND PASTEURISE THE JUICE**





**PARTICIPANTS LISTENING ATTENTIVELY TO A FACILITATOR**



## Appendix 2

### TRAINING WORKSHOP ON THE PROCESSING OF FRUITS INTO JUICES, DRINKS AND CONCENTRATES FOR LOCAL FOOD ENTREPRENEURS --- EVALUATION FORM

The Food Research Institute is most grateful that you were able to attend this workshop. In order to continue and improve upon subsequent workshops, the FRI would be most grateful if you could spend a few minutes to answer the following questions.

#### **Topic 1: Procurement, Storage and Pre-washing**

		<u>Please Tick</u>
1.	Level of Difficulty (In Understanding Topic)	Easy ( )
		Fairly Difficult ( )
		Difficult ( )
		Too Difficult ( )
2.	Relevance/Importance (Of Topic)	Very Relevant ( )
		Relevant ( )
		Fairly ( )
		Not Relevant ( )
3.	Style of Presentation	Very well presented ( )
		Good presentation ( )
		Average ( )
		Below Average ( )
4.	Knowledge Acquired	Excellent ( )
		Good ( )
		Fair ( )
		Poor ( )
5.	Time	Very Adequate ( )
		Adequate ( )
		Fairly Adequate ( )
		Inadequate ( )

#### **Topic 2: Grading, Washing, Preparations for processing & Juice Extraction**

1.	Level of Difficulty (In Understanding Topic)	Easy ( )
		Fairly Difficult ( )
		Difficult ( )
		Too Difficult ( )
2.	Relevance/Importance (Of Topic)	Very Relevant ( )
		Relevant ( )
		Fairly ( )



		Not Relevant	( )
3.	Style of Presentation	Very well presented	( )
		Good presentation	( )
		Average	( )
		Below Average	( )
4.	Knowledge Acquired	Excellent	( )
		Good	( )
		Fair	( )
		Poor	( )
5.	Time	Very Adequate	( )
		Adequate	( )
		Fairly Adequate	( )
		Inadequate	( )

**Topic 3: Product Modification, Microbiology, Pasteurisation, Preservatives & other additives**

1.	Level of Difficulty (In Understanding Topic)	Easy	( )
		Fairly Difficult	( )
		Difficult	( )
		Too Difficult	( )
2.	Relevance/Importance (Of Topic)	Very Relevant	( )
		Relevant	( )
		Fairly	( )
		Not Relevant	( )
3.	Style of Presentation	Very well presented	( )
		Good presentation	( )
		Average	( )
		Below Average	( )
4.	Knowledge Acquired	Excellent	( )
		Good	( )
		Fair	( )
		Poor	( )
5.	Time	Very Adequate	( )
		Adequate	( )
		Fairly Adequate	( )
		Inadequate	( )

**Topic 4: Types of fruit juices, drinks and concentrates, juices & drinks from concentrates and storage of concentrates**

**Please Tick**

1.	Level of Difficulty (In Understanding Topic)	Easy	( )
		Fairly Difficult	( )
		Difficult	( )

		Too Difficult	( )
2.	Relevance/Importance (Of Topic)	Very Relevant	( )
		Relevant	( )
		Fairly	( )
		Not Relevant	( )
3.	Style of Presentation	Very well presented	( )
		Good presentation	( )
		Average	( )
		Below Average	( )
4.	Knowledge Acquired	Excellent	( )
		Good	( )
		Fair	( )
		Poor	( )
5.	Time	Very Adequate	( )
		Adequate	( )
		Fairly Adequate	( )
		Inadequate	( )

**Topic 5: Quality Assurance (HACCP, TQM), Aseptic packaging & Shelf-life**

		<u>Please Tick</u>	
1.	Level of Difficulty (In Understanding Topic)	Easy	( )
		Fairly Difficult	( )
		Difficult	( )
		Too Difficult	( )
2.	Relevance/Importance (Of Topic)	Very Relevant	( )
		Relevant	( )
		Fairly	( )
		Not Relevant	( )
3.	Style of Presentation	Very well presented	( )
		Good presentation	( )
		Average	( )
		Below Average	( )
4.	Knowledge Acquired	Excellent	( )
		Good	( )
		Fair	( )
		Poor	( )
5.	Time	Very Adequate	( )
		Adequate	( )
		Fairly Adequate	( )
		Inadequate	( )



**Topic 6: Plant design and Location**

		<u>Please Tick</u>	
1.	Level of Difficulty (In Understanding Topic)	Easy	( )
		Fairly Difficult	( )
		Difficult	( )
		Too Difficult	( )
2.	Relevance/Importance (Of Topic)	Very Relevant	( )
		Relevant	( )
		Fairly	( )
		Not Relevant	( )
3.	Style of Presentation	Very well presented	( )
		Good presentation	( )
		Average	( )
		Below Average	( )
4.	Knowledge Acquired	Excellent	( )
		Good	( )
		Fair	( )
		Poor	( )
5.	Time	Very Adequate	( )
		Adequate	( )
		Fairly Adequate	( )
		Inadequate	( )

**Topic 7: Management of processing- Throughput & Timing of Processing**

1.	Level of Difficulty (In Understanding Topic)	Easy	( )
		Fairly Difficult	( )
		Difficult	( )
		Too Difficult	( )
2.	Relevance/Importance (Of Topic)	Very Relevant	( )
		Relevant	( )
		Fairly	( )
		Not Relevant	( )
3.	Style of Presentation	Very well presented	( )
		Good presentation	( )
		Average	( )
		Below Average	( )
4.	Knowledge Acquired	Excellent	( )
		Good	( )
		Fair	( )
		Poor	( )

5.	Time	Very Adequate	( )
		Adequate	( )
		Fairly Adequate	( )
		Inadequate	( )

**Topic 8: Management: Repairs & Maintenance**

1.	Level of Difficulty (In Understanding Topic)	Easy	( )
		Fairly Difficult	( )
		Difficult	( )
		Too Difficult	( )
2.	Relevance/Importance (Of Topic)	Very Relevant	( )
		Relevant	( )
		Fairly	( )
		Not Relevant	( )
3.	Style of Presentation	Very well presented	( )
		Good presentation	( )
		Average	( )
		Below Average	( )
4.	Knowledge Acquired	Excellent	( )
		Good	( )
		Fair	( )
		Poor	( )
5.	Time	Very Adequate	( )
		Adequate	( )
		Fairly Adequate	( )
		Inadequate	( )

**Topic 9: Management: Business, Records etc**

1.	Level of Difficulty (In Understanding Topic)	Easy	( )
		Fairly Difficult	( )
		Difficult	( )
		Too Difficult	( )
2.	Relevance/Importance (Of Topic)	Very Relevant	( )
		Relevant	( )
		Fairly	( )
		Not Relevant	( )
3.	Style of Presentation	Very well presented	( )
		Good presentation	( )
		Average	( )
		Below Average	( )
4.	Knowledge Acquired	Excellent	( )
		Good	( )



Fair ( )

Poor ( )

5. Time

Very Adequate ( )

Please add any other comments/ suggestions;

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Thank you.

COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH



## FOOD RESEARCH INSTITUTE

TRAINING WORKSHOP IN PROCESSING OF  
FRUIT JUICES, DRINKS AND CONCENTRATES

From 16TH JULY to 20TH JULY 2001

**THIS CERTIFICATE IS AWARDED TO**

**AMENYONYON KOFFI CHRYSSTOPHER**

Given at FRI this 20th day of July 2001

Waqar Hussain

Course Co-ordinator

Waqar Hussain

Director



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