Hands-on Food Testing Training for Analysts from Ethiopia

Accra, Ghana
May 28 - June 5, 2012

Training Report

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Executive Summary

PQM, in collaboration with the Ghana Food and Drugs Board (FDB), conducted hands-on food testing training in Accra, Ghana for three analysts from the Product Quality Assessment Directorate (PQAD), the quality control lab of the Ethiopia Food, Medicines and Health Care Administration and Control Authority (FMHACA). The goal of the training was to equip the analysts with the skills needed to properly test food products. The analysts were trained on current analytical instrumentation and methodologies for food products, and the trainees stated that the training provided them with the skills and confidence to start food quality testing in their laboratory.

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TABLE OF CONTENTS

Acknowledgements....4
Acronyms....5
Background....6
Purpose of Trip....6
Source of Funding....6
Overview of Activities....6
Conclusion....7
Next Steps....7
Annex 1: Training Agenda....8
Annex 2: Participant Evaluations....10
Annex 3: List of Documents Provided to PQAD Analysts by FDB....11
Annex 4: List of Equipment and Supplies PQAD Needs for Food Testing....12

About PQM

The Promoting the Quality of Medicines (PQM) program, funded by the U.S. Agency for International Development (USAID), is the successor of the Drug Quality and Information (DQI) program implemented by the United States Pharmacopeia (USP). PQM is USAID's response to the growing challenge posed by the proliferation of counterfeit and substandard medicines. By providing technical assistance to developing countries, PQM helps build local capacity in medicine quality assurance systems, increase the supply of quality medicines to priority USAID health programs, and ensure the quality and safety of medicines globally. This document does not necessarily represent the views or opinions of USAID or the United States Government. It may be reproduced if credit is given to PQM and USP.

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ACRONYMS

DQI	Drug Quality and Information Program
FDB	Food and Drugs Board
FMHACA	Food, Medicine and Health Care Administration and Control Authority
GSA	Ghana Standards Authority
LSD	Laboratory Services Department
PEPFAR	President's Emergency Plan for AIDS Relief
PMI	President's Malaria Initiative
PQAD	Product Quality Assessment Directorate
PQM	Promoting the Quality of Medicines Program
USAID	United States Agency for International Development
USP	United States Pharmacopeia

Background

The U.S. Agency for International Development (USAID) and U.S. Pharmacopeia (USP) have been providing technical assistance to Ethiopia since 2008, through the Promoting the Quality of Medicines (PQM) program. PQM receives funding from the President's Emergency Plan for AIDS Relief (PEPFAR) and the President's Malaria Initiative (PMI) through USAID/Ethiopia to strengthen the capacity of the Food, Medicine and Health Care Administration and Control Authority (FMHACA). A critical component of PQM's technical assistance has been to strengthen the Product Quality Assessment Directorate (PQAD) laboratory's compliance with international quality management system (QMS) standards. With technical assistance from PQM, in 2011 the Ethiopia PQAD attained the internationally recognized ISO/IEC 17025:2005 accreditation for testing and calibration laboratories for on seven analytical techniques.

Purpose of Trip

In addition to medicines, the PQAD has responsibility for testing food products to support product safety and quality. In the spirit of south-south cooperation, the Laboratory Services Department (LSD) of the Ghana Food and Drugs Board (FDB) and PQM provided hands-on training in techniques commonly used in food testing for three analysts from PQAD. This training was conducted to build capacity in the PQAD lab regarding food quality evaluation.

Source of Funding

These activities were funded by USAID/Ethiopia through the PMI and PEPFAR programs.

Overview of Activities

The training activities are summarized in the table below:

Item	Description
Specific Objectives/ Expected Outcomes	• Equip analysts with the skills and knowledge required to perform quality tests on food items • Train analysts in analytical techniques commonly used in food quality testing • Teach analysts sample preparation procedures employed in the testing of food products • Prepare the analysts to play a role in assuring the quality of food products in their home country
Venue/Location	LSD, FDB Ghana, Accra, Ghana
Organizer	PQM and LSD
Trainers and Facilitators	• Mr. Cheetham Mingle • Mr. Percy Adomako Agyekum • Mrs. Marian Komey • Mr. Kevin Kufe • Mr. Leslie Owusu–Ansah
Agenda	See Agenda in ***Annex 1*** for detailed information.
Trainees	• Mr. Solomon Getachew • Mr. Teferi Mantegaftot • Mr. Seyoum Wolde

Modules	Methods of analyses of the following food items: • Fats and oils, including butter and margarine type fat spreads • Canned fish • Milk and milk products • Flour-based products (biscuits) • Fruit juices • Jam and marmalade • Tomato paste/puree • Packaged juices containing preservatives The training involved the use of current analytical instrumentation and methodologies to test these food products. The trainees performed the specified physicochemical tests using the appropriate instrumental parameters for the product being tested.
Closing	Certificates were presented to the participants.
Training Evaluation	A summary of participant evaluations is provided in ***Annex 2***.
Conclusion	The objectives for the training were met, and participants are now fully trained in the current analytical instrumentation and methodologies for testing food commonly available in their home country.
Next Steps	PQM will review the training materials and improve them, as appropriate, based on the feedback received from trainees.

Additional Activities

Specifications and Equipment for Food Testing

The PQAD analysts were provided with methods of analysis and/or specifications for testing several food items. A list of these items is included in ***Annex 3***. Also, based on their experience from the training, the participants compiled a list, for PQAD management review, of the major equipment and materials that they believe are needed to start food testing. This list is included in ***Annex 4***.

Visit to Ghana Standards Authority (GSA) Laboratory

The analysts expressed interest in visiting a pesticide residue testing laboratory. The LSD staff arranged for the participants to visit Ghana's pesticide residue laboratory within the GSA. The analysts toured the lab, noting in particular the equipment, staffing, workflow, and Standard Operating Procedures.

Annex 1

Agenda

May 28 – June 05, 2012

Day	Activities
Monday	• **Opening meeting & Lecture** o Introduction and overview of FDB Lab o Review agenda, training objectives, and expected outcomes o Food Analysis – Brief Overview • **Hands-on:** Canned Food (Fish) o Physical Examination o Can Integrity o Free Fatty Acids o Peroxide Value o Discussions
Tuesday	• **Hands-on**: Fats & Oils (Edible Oil, Butter or Margarine) o Physical Examination o Moisture o Specific gravity o Acid Value o Peroxide value Butter o Fat o Acidity of extracted fat o Ash o Acid insoluble ash o Free fatty acids o Saponification value
Wednesday	• **Hands-on**: Fats & Oils (Edible Oil, Butter or Margarine) o Continue Fats & Oils testing o **Discussions** • **Hands-on**: Dairy Products (Evaporated Milk or Fresh Milk, and Cheese) o Physical Examination o Protein o Fat o Free fatty acids o Total solids o Ash Cheese o Salt o Water (moisture)

Thursday	• **Hands-on**: Dairy Products (Evaporated Milk or Fresh Milk, and Cheese) o Continue Dairy Products testing o **Discussions**
Friday	• **Hands-on**: Cereals (Flour and Biscuits) o Physical Examination o Ash o Acid Insoluble Ash Biscuit o Fat o Acidity of Extracted Fat o **Discussions**
Saturday	• **Hands-on**: Coffee and tea Leaves o Physical Examination o Moisture o Total Ash o Water Insoluble Ash o Alkalinity of Soluble Ash o Acid Insoluble Ash o Total Alkalinity of the Water Extract o pH of Water Extract o **Discussions**
Monday	• **Hands-on**: Sugar (Sucrose) and/or Honey o Physical Examination o Moisture o Sulfated Ash o Reducing Sugars o Polarization (sucrose content) o Extraneous Water Insoluble Matter o Acidity (as mL 0.1N NaOH, as formic acid) o Total Sugars after inversion o **Discussions**
Tuesday	• **Hands-on**: Salt (Table Salt) o Physical Examination o Water Insoluble Matter o Acid Insoluble Matter o Sodium Chloride Content o Calcium o Magnesium o **Discussions** • **Closing** o Wrap-up training o Complete evaluation sheets o Distribute Certificates

Annex 2

Evaluation Form

Overall Evaluation of the Training Workshop				
	Extent to which the training met your overall expectations			
TRAINING	**Exceeded Expectations**	**Met Expectations**	**Met Some Expectations**	**Unsatisfactory**
Hands-on Food Testing Training		3 / 3		

Evaluation of Specific Aspects of the Training Workshop			
	Strongly agree	**Agree**	**Somewhat disagree**
Course objectives were relevant to my needs	3 / 3		
The training material helped me understand and better organize my data	1 / 3	2 / 3	
I was able to understand the content of the materials presented	3 / 3		
Overall, the course was useful and will help me do my job better	3 / 3		
There were enough practical exercises to facilitate understanding of the course	1 / 3	2 / 3	
The pacing of the various sessions was appropriate for my understanding of course materials	2 / 3	1 / 3	
The sequence in which the sessions were presented was appropriate for my understanding	1 / 3	2 / 3	
The instructors allowed an appropriate level of participation	3 / 3		
The instructors allowed an appropriate level of participation	3 / 3		

Other Comments/Suggestions:

What did you like best about the course?

- Trainers were very friendly and tried all they could to make the principles clear
- It is practical – what I really need
- After performing the test there were blank worksheets for the result
- Material was well-organized except for a few tests
- We were given the chance to ask questions any time and trainers were willing to answer

What did you like least about the course?

- Nothing

What are your recommendations/suggestions for improvement of the course?

- Training materials should include all tasks performed during the training
- More practical sessions
- PQM should give more training sessions on food analysis with automated equipment
- Thorough theoretical presentation before hands-on practical session

Annex 3

List of Documents Provided to PQAD Analysts by FDB

1. Specification for Canned sardines and sardine type Products (Hard copy)
2. Specification for processed tomato paste and tomato puree (Hard copy)
3. Specification for Sugars (Hard copy)
4. Specification for concentrated pineapple juice with preservatives (Hard copy)
5. Specification for canned citrus marmalade (Hard copy)
6. Specification for processed fruits and vegetable jams (fruit preserves and jellies) (Hard copy)
7. Specification for Margarine and Margarine type fat spreads (Hard copy)
8. Specification for named vegetable oils (Hard copy)
9. Method of analysis for fat determination on different food items (Soft Copy)
10. Method for Fats and oil analysis (Hard copy)
11. Method of analysis for milk and milk products (Hard copy)

Annex 4

Equipment and Supplies PQAD Needs for Food Testing

1. Oven
2. Vacuum oven
3. Steam bath
4. Soxhlet apparatus
5. Kjeldahl apparatus
6. Gerber butyrometer
7. Gerber centrifuge
8. Milk pipettes
9. Rose-Gottleib tube
10. AOAC recent edition
11. Food codex Allimuntarus