

THE EUROPEAN UNION'S 10<sup>TH</sup> EDF PROGRAMME FOR NIGERIA

# NAFDAC Food and Beverage Proficiency Testing Scheme



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# The National Quality Infrastructure Project for Nigeria (NQIP): Towards the Establishment of a Nigerian Proficiency Testing Scheme

The National Quality Infrastructure Project for Nigeria is supporting the enhancement of the National Quality Infrastructure (NQI). Its purpose is to improve the quality, safety, integrity and marketability of Nigerian goods and services and remove technical barriers to trade by having an adequate, effective and sustainable National Quality Infrastructure in place, consistent with international and regional principles and practices.

At present, there is no Proficiency Testing (PT) provider for food and beverage in Nigeria or in the West Africa region. Furthermore, access to international Proficiency Testing Schemes and providers is often difficult and expensive, especially for developing countries. Hence, the NQIP is supporting the establishment of a Food and Beverage Proficiency Testing Scheme in Nigeria. The National Agency for Food and Drug Administration and Control (NAFDAC) accepted to host and operate this new national Proficiency Testing Scheme.

In February 2015, the NQIP delivered the first phase of the knowledge development training on Proficiency Testing to determine the extent of PT needs in the food and beverage sector with reference to the technical and management requirements of ISO/IEC 17043. By March 2015, over 65 testing laboratories in Abuja, Lagos, Kaduna and Port Harcourt had received the training on ISO 17043 standards for Proficiency Testing, with a focus on the food and beverage testing laboratory needs. Most of these laboratories are not participating in any PT scheme which is, however, a requirement for accreditation. In the course of the training, several international PT schemes were presented to the participants. Participants were taught how to search for international PT schemes and informed about sample costs and which factors to consider when making the selection.

Furthermore, NQIP supported the establishment of the Nigerian National Accreditation Service (NiNAS). This body will accredit testing and calibration laboratories in Nigeria. One of the main requirements for a laboratory to obtain accreditation is to participate in proficiency testing activities.

## What Is Proficiency Testing?

Proficiency Testing is the evaluation of laboratory performance against pre-established criteria by means of inter-laboratory comparison (ISO/IEC 17043:2010).

## What Is Inter-Laboratory Comparison?

Inter-Laboratory Comparison is the comparison of organizational performance and evaluation of measurements or tests of the same or similar items by two or more laboratories in accordance with predetermined conditions.

## Proficiency Testing in Other Parts of the World

In 2003, the Inter-American Accreditation Cooperation (IAAC), whose members are largely based in Central and South America, decided there was a need to establish a database of providers of Proficiency Testing in the region. IAAC then approached the European Proficiency Testing Information System (EPTIS) to discuss the establishment of coordination for the IAAC region. The project was welcomed by EPTIS, received support from the Physikalisch-Technische Bundesanstalt (PTB) and was subsequently approved by the IAAC Executive Committee.

The EPTIS-IAAC Regional Coordination includes most of the countries located in: Central, North and South America and the Caribbean. In 2004, IAAC also decided to join EPTIS as a supporting organization. As long as PT schemes are not yet available within the West Africa region, organizations such as IAAC or EPTIS may be able to assist.

## Why Is Proficiency Testing Needed?

Laboratory Proficiency Testing is an essential element of laboratory quality assurance. With increasing demands for independent proof of competence from regulatory bodies and customers, proficiency testing is becoming relevant to all laboratories testing food for quality and safety in every country. Regular proficiency testing is also important for the technical performance of the laboratory since it provides independent feedback on the quality of analytical results, enabling laboratories to monitor and improve performance over time.

## What Are the Advantages of Proficiency Testing?

- Providing regular, objective and independent assessment of the quality of the routine analysis.
- Delivering comparative information on the performance of methods and instruments.
- Offering an overview of the quality of specific analyses in a particular sector, country or region.
- Identifying potential problems and determining corrective and preventive actions for the improvement of technical work.
- Providing confidence to customers.
- Demonstrating good performance to accreditation bodies for the purpose of accreditation.
- Assisting laboratories in making informed decisions and proper planning for equipment upgrades, where necessary.
- Identifying staff competencies and training needs.

## What is a z-score?

A z-score is a statistical measurement in Proficiency Testing. It compares the laboratory result with the correct value. A score of zero (0) means that a laboratory result is similar to the correct value. The value can be positive or negative depending on whether the laboratory result is higher or lower than the correct value.

## How Does the Proficiency Testing Scheme Operate?

### 1 Analyses

Proficiency Testing Schemes operate by providing participating laboratories with similar samples for concurrent testing. The laboratory analyses the samples, preferably as part of its normal routine, and reports the results to the Proficiency Testing provider (NAFDAC) that then carries out the analysis of data and performance evaluation. Subsequently, the laboratory is provided with the PT report showing how closely the results correspond with accepted values and, where necessary, which actions the laboratory can take to improve its performance.

### 2 Reporting and Assessment

The test results are transformed into performance statistics to help interpretation and allow for comparison. These involve the statistical analysis of results, using robust statistical methods according to ISO 13528. The z-score\* for each result is tabulated and later summarized for each laboratory.

### 3 Confidentiality

All participating laboratories are identified by codes which are only known to the Proficiency Testing coordinator\* for confidentiality purposes. NONE of the Proficiency Testing reports contain names of laboratories.

*\*The Proficiency Testing coordinator can be one or more persons with the responsibility to organize and manage all Proficiency Testing activities involved in the operation of a Proficiency Testing Scheme.*

## Pilot Proficiency Testing and Scheme Design in Nigeria

A trial proficiency testing scheme was successfully launched in February 2016, involving laboratories in Lagos. The next phase, set to launch in 2017, will be a national pilot PT scheme, involving all food testing laboratories in Nigeria for three agricultural products, namely flour, bean/melon seeds and shea butter.

The pilot Proficiency Testing round will include the distribution of PT samples for one or more of the following matrices and analytes listed below. The matrices were determined based on laboratory needs following the evaluation of questionnaires completed by laboratories that participated in the NQIP Proficiency Testing trainings in 2015 and based on strategic export food products by Nigeria.

### 1 Flour

Moisture, total ash, crude fibre, fat, acid insoluble ash, protein, dietary fibre, aflatoxins, energy, carbohydrates, iron, zinc, lead, arsenic, cadmium, vitamin A, riboflavin, folic acid, pesticide residues

### 2 Bean / Melon seeds

Moisture, total ash, acid insoluble ash, protein, fat, lead, arsenic, cadmium, zinc, copper, iron, calcium, phosphorous, potassium, fatty acid profile, carbohydrates, energy, vitamin A, riboflavin, folic acid, crude fibre, dietary fibre, free fatty acids, mycotoxins, pesticide residues

### 3 Shea Butter

Moisture, Impurities, Free Fatty Acids, Oil content, Saponification value, Iodine value, Acid value, Peroxide value, Lead, Arsenic, Cadmium, Calcium, Potassium, Copper, Zinc, Pesticide residues and Mycotoxins

## Participation Requirements

The registration form, which will be available from NAFDAC, should be completed and submitted to the PT coordinator (NAFDAC). A laboratory can participate in one or more matrices.

The pilot round is anticipated to commence in August or September 2017 and will be announced in due course. It is supported by the National Quality Infrastructure Project for Nigeria, therefore no fee will be charged to participants. In future, a participation fee may be charged to offset the costs for the provision of Proficiency Testing.

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