Improvement of Credibility in the Analysis of Palm Oil Through SAMM Accreditation – the MPOB Experience

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ABSTRACT

All palm oil refineries in Malaysia have basic laboratory facilities to monitor the quality of palm oil produced. To improve their credibility in the analysis of palm oil, their laboratory quality system should be strengthened. The laboratory should use recognized or official methods of analysis, and follow internationally recognized laboratory practice. Skim Akreditasi Makmal Malaysia (SAMM) *is one of the internationally recognized schemes. The credibility of a laboratory can be strengthened if it is accorded SAMM accreditation or if it at least adopts SAMM quality system in its operation.*

ABSTRAK

Semua kilang penapisan minyak sawit di Malaysia mempunyai kemudahan makmal asas untuk pengawalan mutu minyak sawit yang dihasilkan. Untuk meningkatkan mutu dan kebolehpercayaan terhadap keputusan analisis yang dihasilkan, sistem kualiti makmal perlu dipertingkatkan, terutama dari segi penggunaan kaedah analisis dan sistem pengurusan makmal yang telah diiktiraf di peringkat antarabangsa. Salah satu sistem pengurusan makmal yang diiktiraf di peringkat antarabangsa adalah Skim Akreditasi Makmal Malaysia (SAMM). Dengan diakreditasi di bawah SAMM atau sekurang-kurangnya menerima pakai sistem yang digunakan oleh SAMM, kebolehpercayaan makmal boleh dipertingkatkan.

INTRODUCTION

There are 46 palm oil refineries currently in operation in Malaysia (MPOB, 2000) and most of them have basic laboratory facilities to carry out quality control and assurance activity with an objective of meeting the product specification stipulated by the Palm Oil Refiners' Association of Malaysia (PORAM). It is crucial that a palm oil laboratory produces reliable results. The performance and credibility of a laboratory can be improved if it adopts sound laboratory practice. The credibility can be further strengthened if it is accorded the *Skim Akreditasi Makmal Malaysia (SAMM)* accreditation by the Department of Standards Malaysia (DSM). Even though a laboratory may not be ready for SAMM accreditation, it is still advisable that the SAMM quality system be implemented in its operations. SAMM is the Malaysian laboratory accreditation based on the internationally recognized ISO/IEC 17025.

The Analytical Services Laboratory of the Malaysian Palm Oil Board (MPOB) obtained SAMM accreditation in 1999. MPOB encourages refineries to improve the credibility of their laboratories by seeking accreditation under SAMM or at least adopt SAMM procedures in their laboratories. Adoption of SAMM will bring several benefits to a refinery (Lim and Jaraie, 1993).

ADVANTAGES OF SAMM ACCREDITATION

Benefits to the Management

a. The laboratory is capable of meeting management's requirements for reliable and accurate testings;

b. The laboratory has its operations, facilities, resources and procedures independently assessed according to internationally recognized standards;

c. It enhances the image of the refinery as it has accredited testing facilities to monitor the quality of palm or palm kernel oil produced; and

d. The tests performed or results issued will be accepted internationally.

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Benefits to the Laboratory

a. The laboratory has a quality management system and a framework for quality assurance in its testings. Staff are required to follow the system to ensure that high standards of performance are met;

b. It keeps staff in touch with new developments and new ideas;

c. It gives an independent and objective assessment of staff testing skill;

d. By adopting the SAMM quality policy management system, there is a constant appraisal of staff performance, thus providing better assurance against the risk of error;

e. The skill and performance of laboratory staff are given due recognition in accordance with international standards;

f. The mandatory quality audits provide the management an effective tool to regularly assess the weakness and strength of the system for remedial action; and

g. SAMM accreditation helps improve staff efficiency and competency in quality control and assurance activities of the product.

ACCREDITATION PROCEDURE

For those laboratories that have not been accredited under SAMM but wish to seek accreditation, the following processes should be followed:

a. Evaluation of existing quality management system, making the necessary changes to suit ISO/IEC 17025 requirements;

b. Preparation of a Laboratory Quality Manual and associated documents;

c. Application to DSM;

d. Pre-assessment by SAMM assessors;

e. Compliance assessment by SAMM assessors;

f. Award of SAMM certificate; and

g. Surveillance visits by SAMM assessors.

This paper discusses only guidelines on how to develop a laboratory quality system before applying for SAMM accreditation.

The preparation of the laboratory quality manual and its associated documents is an important step towards seeking SAMM accreditation. These documents serve as important references for the laboratory quality system. They include:

a **The Laboratory Quality Manual**. This document states the laboratory policy, procedures and practices for every area of activity and identifies the authority and responsibilities for its implementation (Department of Standards Malaysia, 1997; 1999). Where appropriate, references to the relevant Operating Procedures are made in the implementation of the quality policy. This is the main document of the laboratory quality system.

b **The Laboratory Operating Procedures**. The Laboratory Operating Procedures address the implementation of the quality policy (Department of Standards Malaysia, 1997; 1999) and also stipulate the responsibilities and authorities of the various personnel. These procedures support the quality policy statement and serve as a second level document.

c **Work Instructions and Test Procedures**. These instructions and procedures describe the specific method of tests or calibrations and other detailed administrative and technical instructions which are necessary for ensuring the smooth performance of the laboratory. As far as possible, the laboratory should adopt official or recognized standard methods of analysis such as AOCS, PORIM, ISO, BSI, IUPAC, ASTM, *etc*. If the laboratory is using in-house methods, they should be validated against appropriate recognized methods with statistical comparison.

Work instructions or Test Procedures serve as a third or fourth level document in the laboratory quality system.

d. **Files/records**. The laboratory should establish certain files or records to document all activities carried out as these will provide material evidence on the proper implementation of the laboratory quality system.

In preparing the laboratory quality manual and its associated documents, a laboratory should refer to SAMM documents produced by DSM (Department of Standards Malaysia, 1997; 1999).

Generally, the overall Laboratory Quality System requires that the laboratory:

a. Has regular and scheduled calibrations of all critical instruments and apparatus;

b. Uses validation samples, mandatory checks to ensure the integrity of analytical results;

c. Uses validated methods and procedures;

d. Participates in proficiency testing programmes; and

e. Practises mandatory audits and management reviews.

It is important that all the above activities of the laboratory are documented for reference and inspection by the auditors and assessors.

Before a laboratory applies for accreditation, it must possess the following:

a. Competency to perform the tests;

b. Sound laboratory management;

c. Suitably qualified and trained staff;

d. Proper equipment management, and adherence to calibration and maintenance programmes;

e. An accurate and complete record keeping;

f. Adequate quality control and quality assurance procedures;

g. Appropriate facilities for the handling, storage and testing of samples;

h. A proper system to assess suppliers of consumables and support services; and

i. Commitment to do things right.

Although the SAMM accredited laboratory gains a lot of benefits, it may not be cost effective for a small laboratory or one that analyses few samples. This is because faithful compliance to the SAMM system needs extra time, paper work and manpower. Furthermore, it can be costly to implement the following mandatory activities:

a. Documentation of laboratory activities for reference and inspection by the auditors and assessors;

b. Quality control system - to ensure integrity of the results produced;

c. Calibration and/or validation of equipment, thermometers and volumetric glassware;

d. Purchase of reference materials or traceable standards;

e. Participation in inter-laboratory comparisons;

f. Determination of uncertainty for every test parameter;

g. Organization of internal audits, quality system reviews and surveillance assessments.

CONCLUSION

By securing SAMM accreditation or at least adopting SAMM procedures, the credibility and performance of a laboratory can be improved. MPOB is committed to improve the credibility of its laboratories in providing independent analytical services and monitoring the quality of palm oil, palm kernel oil and their products.

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