

PALM OIL STANDARD REFERENCE MATERIALS FOR DETERMINATION OF SOLID FAT CONTENT

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The solid fat content (SFC) is a major concern in food applications, and is generally considered the fingerprint of oils and fats to characterize the physical and sensory properties of foods such as spreadability, texture, firmness and mouth-feel. Knowing the SFC would be useful for formulating new products and also for authenticating the oil and fat.

Due to the importance of characterization of oils and fats, the consistency of measuring the SFC is crucial in ensuring the quality of the products. Reliable SFC measurement is made by using standard reference materials (SRMs) as benchmarks. The SRMs provide the essential references by which the analysts can compare their results. However, the unavailability of SRMs from palm oil products has prompted the Malaysian Palm Oil Board (MPOB) to conduct certification programmes and produce such SRMs for use by industries and laboratories.

To date, MPOB has already developed palm oil SRMs for iodine value (IV), slip melting point (SMP) and fatty acid composition (FAC). A new series of SRMs was recently developed and certified through inter-laboratory proficiency programmes. The SRMs developed can be used by laboratories to improve their standard and credibility in accordance with ISO/IEC 17025:1999 accreditation. This will also promote MPOB as a certification and reference centre for palm oil SRMs.

PRODUCTION OF PALM OIL SRMs

Palm oil, palm olein and palm stearin were heated and mixed thoroughly with an antioxidant. The homogenized oils were pipetted into ampoules and sealed under nitrogen blanketing. The SRMs were then labelled, packed in fabricated boxes and stored at -20°C before being sent for the inter-laboratory proficiency programme. The results from

different laboratories were evaluated via SoftCRM 1.2.0 Software, developed by the European Commission of Standards, Measurements and Testing Programmes (1997) for certification of the palm oil SRMs produced (Figure 1).

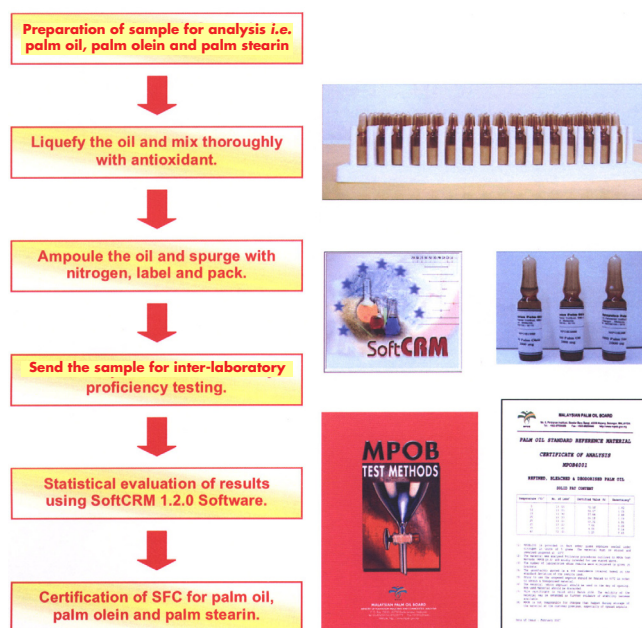


Figure 1. Steps in production of palm oil SRMs.

SPECIFICATIONS

The palm oil SRMs for SFC were characterized and certified based on MPOB Test Methods (MPOB p4.8). The SRMs consisting of palm oil, palm olein and palm stearin, are produced through inter-laboratory proficiency programmes, which involved numerous accredited testing laboratories worldwide. Each SRM is accompanied with its detailed certification for 0°C up to 45°C. The certified values (SFC measurement) and their uncertainties were evaluated at 95% confidence interval using the Soft CRM 1.2.0 Software (Table 1). The application of the software generate consensus values attesting to the accuracy of the results.

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TABLE 1. CERTIFIED VALUES AND THEIR UNCERTAINTIES FOR SFC MEASUREMENT OF PALM OIL SRMs

Temperature (°C)	Certified value (uncertainty)		
	Palm oil (%)	Palm olein (%)	Palm stearin (%)
0	71.12 (1.82)	66.32 (1.93)	78.09 (1.23)
10	54.07 (1.05)	43.53 (1.32)	67.66 (0.71)
15	37.44 (0.88)	22.5 (0.78)	56.29 (1.18)
20	24.18 (1.09)	6.68 (1.14)	44.37 (1.13)
25	13.32 (0.86)	1.40 (0.35)	30.22 (1.25)
30	7.64 (0.28)	-	20.08 (0.58)
35	4.05 (0.14)	-	13.72 (0.32)
40	1.25 (0.49)	-	8.97 (0.72)
45	-	-	5.06 (0.41)

APPLICATIONS OF PALM OIL SRMs

The palm oil SRMs are suitable for use in various applications, such as method development and establishment, method validation, calibration of instrument device, assessment of laboratory performance, estimation of uncertainty and traceability, internal quality control, proficiency testing *etc.*

based on *MPOB Test Methods*. Using the SRMs ensure that the analyses performed are reliable, accurate and comparable between laboratories globally. The inexpensive SRMs offer an alternative to other international standards available in the market. The palm oil SRMs allow laboratories to provide quality assurance on their test methods used.

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