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**Related products**  
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Application Notes  
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# Palm Oil Analysis



## Introduction

Palm oil is produced from the pulp of palm fruits. In its natural form it is of red colour due to the presence of carotene. Palm oil is the biggest source of carotene which is a potent anti-oxidant and precursor of Vitamin A. Due to these facts, palm oil has been used to treat many health problems including vitamin A deficiency, cancer, brain disease, aging, and treating malaria, high blood pressure, high cholesterol, and cyanide poisoning etc. The natural form is further processed to produce refined palm oil.

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The test method Deterioration of Bleachability Index (DOBI) is widely used in assessing the quality of palm oil. Palm oil is used in various food products such as margarines, spreads, confectionary fats, ice cream, due to which the quality testing process has become very important. DOBI is the numeric ratio of the spectrophotometric absorbance at 446 nm and 269 nm. Table 1. depicts the DOBI value and the relative grades based on that.

DOBI	Grade
< 1.68	Sludge palm oil
1.68 – 2.30	Poor
2.31 – 2.92	Fair
2.93 – 3.24	Good
> 3.24	Excellent

Rather than just measuring the DOBI value, there are advantages of measuring the carotene contents in

## Result

The test results are presented in Table 2. The low DOBI value and the carotene content reveals

Table 2. Palm oil test results

Sample	$\lambda$ (nm)	Absorbance	DOBI value	Carotene content (mg/ml)
Palm oil	A446	0.1218	0.35	116.62
	A269	0.3445		

palm oil samples as well, as it provides a greater understanding of quality of a certain grade.

## Instrument and Materials

1. Alpha spectrophotometer
2. Cuvette (1 cm pathlength)
3. Analytical balance
4. Palm oil samples
5. Hexane (anhydrous, 95 %)

## Method

0.1 g of palm oil is dissolved in hexane. Then the spectrophotometric absorbances at 446 nm and 269 nm are measured.

## Calculation

$DOBI = A_{446} / A_{269}$  Carotene =  $383 \times A_{446} \times V / W \times 100$   
Where 383 = diffusion coefficient V = value of hexane (ml) W= weight of palm oil sample (g)

that the palm oil sample was of sludge palm oil grade with very low carotene content according to Table 1.

## **Conclusion**

The Alpha spectrophotometer has successfully performed and measured the DOBI and carotene content in the palm oil sample.