

DETERIORATION OF BLEACHABILITY INDEX

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The deterioration of bleachability index or DOBI is an acronym for an analytical procedure intended for quality control of crude palm oil. It is based on the ratio of two wavelengths (446:269 nm). The test, introduced by MPOB in 1981 is performed using a simple spectrophotometer and attempts to provide a prediction of the ease of refining of crude palm oil. Quality of crude palm oil can be described by many well established oxidation parameters. However, none of these by themselves are good enough to tell conclusively the oxidative state of the oil, nor provide an indication whether the oil is easily refinable. Many years of testing by MPOB researchers has found it to be a reliable tool for quality control. The values instituted from MPOB's research are applicable for crude palm oil produced in Malaysia. It may not be applicable to oils produced in other countries as the carotenoids levels of other oil palm species may differ.

To a refiner, it is of importance to be able to establish the quality of incoming raw material and the amount of bleaching earth dosage to use. The amount of earth to be used depends not only on oil quality but also that of the earth. Thus knowing the DOBI value allows the refiner to

establish how much earth is required for refining the oil to an acceptable colour as required by end-users and food manufacturers. Furthermore, DOBI is also correlated with oil stability. Thus, the incorporation of DOBI in the MPOA/PORAM domestic crude palm oil (CPO) sales contract is an important step towards improving quality of Malaysian palm oil.

Palm oil is the leading oil traded in the world's oils and fats market. Malaysia accounts for 49% of the palm oil produced in the world. Palm oil exports from Malaysia accounts for 58% of the world trade in palm oil. Malaysia has always pride itself in producing a high quality palm oil product that is free from contamination. The move to use DOBI in the trade is therefore one of the steps implemented by the Ministry of Plantation Industries and Commodities, MPOB and the industry to maintain the high standards achieved. It must be mentioned that DOBI had been used by the industry for many years since the eighties even though it had not been a trade specification. In-house quality controls of crude palm oil received by refiners had been used as a check of quality of raw materials and for estimation of suitable type and amount of bleaching earth to be used.

TABLE 1.

DOBI value	Mechanism
2.31	Basis (load basis)
Less than 2.31 to 2.10	Adjustment on load basis (i) RM 3 t ⁻¹ for lorry tankers (ii) RM 2 t ⁻¹ for barge vessels with 500 t or more
Less than 2.10	Rejectable on load basis.

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$$\text{DOBI} = \frac{\text{Absorbance at 446 nm}}{\text{Absorbance at 269 nm}}$$

Figure 1. A simple ratio that predicts the quality of crude palm oil.

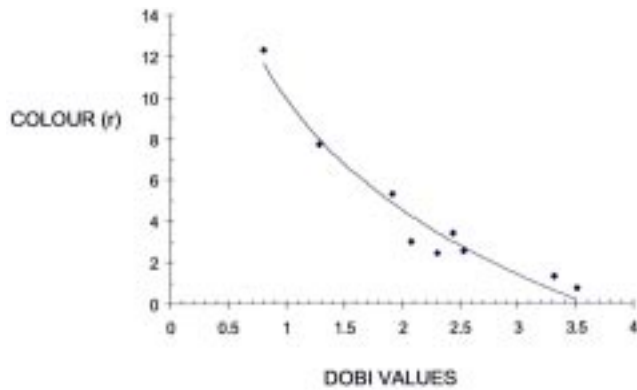


Figure 2. Correlation between colour of refined oils with DOBI.

TABLE 2. DOBI AND OIL STABILITY

DOBI	RANCIMAT AT 100°C(h)
1.2	26.2
1.9	41.3
2.0	43.9
2.7	46.8
3.0	57.6
3.1	65.3

TABLE 3. USE OF DOBI TO DISTINGUISH GOOD VERSUS POOR OILS WITH SIMILAR FFAs

FFA	DOBI	Colour (Red)
3.36	2.2	2.9
3.38	1.8	4.4
3.73	2.0	3.7
3.32	2.7	2.2
3.12	2.8	1.7
3.33	2.7	1.8

Both MPOA and PORAM have reached a consensus to incorporate DOBI into the Domestic Sales Contract issued jointly by the two associations beginning 1 July 2004, marking a milestone for Malaysian palm oil industry. It shows that the palm oil industry and the government are fully committed towards production of high quality palm oil. The agreed parameter for incorporation are given in Table 1.

The values instituted in MPOB's research are applicable for crude palm oil produced in Malaysia. It may not be applicable to oils produced in other countries as the carotenoids levels of other oil palm species may differ.

TABLE 4. FACTOR AFFECTING DOBI VALUES

- Quality of palm fruits.
- Degree of ripeness.
- Processing and storage conditions.
- Time between harvesting and sterilization.
- Temperature.
- Aeration in tanks.
- Contamination.

TABLE 5. INTERNATIONAL DEVELOPMENT IN ADOPTION OF DOBI

- Britannia Food Ingredients, UK.
- Inform, AOCS publication Vol 12, No. 12, p. 1183, 2001.
- International Standard Organization (ISO).
- International ring tested in 2003
- Used by international buyers of crude palm oil.

For more information kindly contact:

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