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ANALYSIS OF GROUNDNUTS FROM LOCALLY GROWN VARIETIES FOR OIL CONTENT AND PHYSICO-CHEMICAL CHARACTERISTICS OF EXTRACTED OIL

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Keywords: Local groundnut varieties, Oil content, Physico-chemical characteristics

RINGKASAN

Contoh-contoh dari sepuluh jenis (varieties) kacang tanah yang ditanam di Malaysia dan dikeluarkan oleh Cawangan Tanaman Ladang MARDI, telah dikaji untuk mengetahui kandungan air dan minyak di dalamnya. Minyak yang dikeluarkan dari kacang ini dikaji mengenai sifat kimia – fizikalnya. Kebanyakan kacang yang mengeluarkan minyak didapati mempunyai acid lemak bebas (free fatty acid), nilai warna dan unsaponifiable matter yang rendah. Oleh itu minyak ini boleh diperoses untuk pembersihan. Kandungan minyak dari kacang ini berbeza dari 45% – 49%.

INTRODUCTION

Originally a native of South America, the groundnut is widely cultivated in other parts of the world, notably West Africa and Asia. Groundnut and groundnut oil is not new to Malaysia. However, the acreage under groundnut cultivation is small as compared to other crops. There are only 4,800 ha under groundnut cultivation out of 3.2 million ha of cultivated land.

Most of the locally grown groundnuts are for consumption as whole in-shell roasted nuts and only a small amount is utilized for oil extraction. A large portion of groundnut oil therefore, is imported from other countries, mainly mainland China and Singapore. About 2,400 tons of groundnut oil was imported into Malaysia in 1974 (ANON, 1974).

Although groundnut has been grown in Malaysia for quite sometime, the varieties are not homogenous and in most cases unknown. Most of the planting materials were imported from Indonesia and so the yield and the physico-chemical characteristics of the oil extracted, to a certain extent, varied with each import. Therefore, there exists a need to look into the oil content and quality of the known groundnut varieties, so as to select a suitable variety for cultivation, if and when Malaysia intends to cultivate this crop for oil extraction.

MATERIALS AND METHOD

Nuts from ten varieties (listed below), were supplied by the Field Crop Branch of MARDI.

Varieties	Analytical Code
Kidang	A
Sungei Siput	B
Equatorial Red	C
Spanette	D
Tainan	E
Gadjah	F
Menglembu	G
PBI–9	H
F334	I
Moket	J

The nuts were analysed for oil content and the physico-chemical characteristics of the extracted oil were studied.

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Preparation of Samples for Analysis

The groundnut samples received had already been treated with fungicide. The nuts were then washed with tap water to remove the fungicide. The washed nuts were first wiped with a cloth and then left for a few hours at ambient temperature to dry.

The skin (testa) of the nuts were removed by hand. The nuts were then ground to a fine powder (125 micron) in a Micromill. Each ground sample was mixed thoroughly with a spatula before sealing it in a plastic pouch and stored at 5°C until needed for analysis.

Moisture determination

10.0g of the powdered sample was put in a petridish (95 mm diameter) with a lid, and dried in a Memmert oven without an internal fan, at 105°C for 8 hours or more to a constant weight. The dish along with the sample was cooled in a dessicator before weighing.

Oil Extraction

The dried residue left after moisture determination was used for the extraction of oil using two methods. In the first method – the residue was transferred quantitatively into the extraction thimble. The petridish was washed three times with the solvent [Petroleum ether (40°/60°C)] and the washings transferred into the soxhlet apparatus. The residue was initially extracted for two hours. The residue was reground and reextracted for a further eight hours. After distilling off the solvent, the extracted oil sample was dried in a vacuum (70 mmHg) at 70°C until a constant weight was obtained.

From the weights of the dried residue and the extracted oil, the oil content of the nut sample was calculated on dry basis.

In the second method, 70.0 g of the powdered sample was soaked in 200 ml Petroleum ether (40°/60°C) in a 600 ml Conical flask. The slurry was stirred occasionally and then left overnight. In the morning the clear solution was decanted and fresh batch of Petroleum ether (200 ml) was added into the residue and again left overnight. This procedure was repeated three times. Each time the decanted clear solution was combined with the previous solution. The solvent was evaporated under vacuum using a rotary evaporator.

Finally the extracted oil was dried in a vacuum oven (70 mm Hg) at 70°C until a constant weight was obtained.

The oil obtained by cold extraction was used mainly for physico-chemical analysis.

Free Fatty Acids

5.0 g of the extracted oil dissolved in 50 ml of hot neutralised alcohol was titrated with 0.1N NaOh using 0.5 Thymol blue as an Indicator, to a 'Khaki green' end point.

The FFA (%) was expressed as 'Oleic acid'.

Iodine Value

The iodine value for 0.5 g of the oil sample was determined using Wij's method (COCKS and REDE, 1966).

Saponification Value

This was determined on 5.0 g of the oil sample using the method described by COCKS and REDE, (1966).

Unsaponifiable Matter

5.0 g of the oil sample was used to determine the unisaponifiable matter using the method described by COCKS and REDE, (1966).

Slip Melting Point

This was carried out on oil samples using the official AOCS open capillary tube (Internal diameter 1 mm x External

diameter 2 mm x Length 80 mm) method Cc 3–25 (COCKS and REDE, 1966).

Refractive Index

The refractive index of the oil was determined at 40°C according to the official AOCS method No. Cc7–25 (ANON, 1964) using a Refractometer.

Specific Gravity

The specific gravity was determined on the oil sample using the method described in Malaysian Standards for the analysis of oils and fats (ANON, 1975) but using 25.0 ml specific gravity bottles.

Colour

This was determined on the oil samples according to the AOCS method using Tintometer. The measurements were made in 1'' glass cell.

Fatty Acid Composition

0.5 g of the oil sample was methylated according to the procedure described by LUDDY *et al.* (1968).

The methyl esters were separated on a 'Packard' Gas Chromatograph. The following conditions were used for the separation.

1. Column	: Stainless steel 9' long x 1/8'' diam. with 10% DEGS + 2% Epikote 1001 coated 70/80 chromosorb DMCS (Supelco-code F–50717).
2. Oven temperature	: 200°C – Isothermal
3. Detector temperature	: 250°C
4. Injector temperature	: 250°C
5. Gases flow	: N_2 – 20 ml/min. N_2 – 40 ml/min. Air – 300 ml/min.
6. Attenuation	: 8 x 100
7. Recorder speed	: 7.5 mm/min.
8. Sample size	: 0.2 μl
9. Analysis time	: 30 min.

The area under the chromatographic peaks was determined by triangulation (height multiplied by the breadth at mid-height). The amount of each fatty acid was calculated using the method of Internal Standardization i.e., assuming that the whole components of the oil sample are represented on the chromatogram, so that the total area under the peaks represent 100% of the constituents (total elution).

Statistical Treatment of the Results

From the analytical results obtained from the replicate samples **Mean standard deviation** and the **confidence limits** at 95% level of the mean were calculated.

RESULTS AND DISCUSSION

The results of the analyses are summarised in *Tables 1, 2* and *3.*

The oil content of groundnuts varies with the variety. Certain varieties are consistently high in oil while others are not. Such factors as locality, management methods and climatic conditions exert a strong influence on the oil content which generally varies between 45–55%.

The oil contents of the groundnut samples, as determined by soxhlet method are shown in *Table 1.* Groundnut varieties *Kidang* (48.1 ± 1.1%); *Sungei Siput* (49.4 ± 1.1%) and *Spanette* (48.3 ± 0.1%) have significantly higher oil content than other varieties such as *Tianan* (46.8 ± 0.1%) *Gadjah* (47.1 ± 0.4%); *Menglembu* (46.4 ± 0.9%), *PBI–9* (46.6 ± 0.5%) and *Equatorial Red* (46.5 ± 0.2%); while *Moket* (45.1 ± 0.3%) and *F334–33* (45.5 ± 0.9%) have the lowest oil content.

There is no standard for the slip melting point specified in the codex Alimentasius CAC/RS–21–1969. BAILY *et al.,* (1943) reported the cloud point and pour point of a typical groundnut oil sample as approx. 4.5°C (40°F) and 1.1°C (34°F) respectively. In our analysis we only

TABLE 1: RESULTS OF THE ANALYSIS OF GROUNDNUT OIL SAMPLES

VARIETIES	KIDANG	SG. SIPUT	EQ. RED	SPANETTE	TAINAN	GADJAH	MENGLEMBU	PBI–9	F334–33	MOKET
CODE	A	B	C	D	E	F	G	H	I	J
MOISTURE (%)	8.1±0.2	9.0±0.1	9.3±0.1	7.8±0.2	8.6±0.2	8.6±0.8	9.4±0.2	9.4±0.6	9.2±1.4	9.0±2.5
OIL CONTENT (% DRY BASIS)	48.1±1.1	49.4±1.1	46.5±0.2	48.3±0.1	46.8±0.1	47.1±0.4	46.4±0.9	46.6±0.3	45.5±0.9	45.1±0.3
SLIP MELTING POINT (°C)	9.0±0.6	9.7±0.3	10.0±0.3	10.5±0.2	10.1±0.1	10.0±0.5	10.1±0.5	11.1±0.5	10.2±0.2	10.2±0.5
WIJ'S IODINE VALUE (g. of I_2/100g of oil)	89±4 (94)	92±2 (94)	93±3 (94)	91±1 (93)	92±3 (95)	94±2 (95)	93±2 (96)	93±2 (94)	94±2 (95)	90±5 (96)
FREE FATTY ACIDS (% AS OLEIC ACID)	(1.6±0.1	(2.0±0.1)	*(3.0±0.1)	(1.0±0.1)	(1.4±0.1)	(1.9±0.1)	*(2.2±0.1)	*(3.1±0.1)	(1.6±0.1)	(1.3±0.1)
SAPONIFICATION VALUE (mg. of KOH/g. of oil)	(185)	(185)	(183)	(188)	(189)	(189)	(189)	(190)	(197)	(188)
UNSAPONIFIABLE MATTER (g/kg. of oil)	(5.5)	(6.6)	(5.5)	(5.3)	(4.6)	(5.6)	(4.1)	(3.3)	(12.6)	(3.3)
REFRACTIVE INDEX AT 40°C	1.4635± 0.0002 (1.4636)	1.4631± 0.0001 (1.4623)	1.4631± 0.0001 (1.4628)	1.4631± 0.0001 (1.4619)	1.4651± 0.0001 (1.4622)	1.4639 0.0001 (1.4632)	1.4635± 0.0001 (1.4627)	1.4639± 0.0001 (1.4628)	1.4634± 0.0001 (1.4628)	1.4838± 0.0001 (1.4630)
SPECIFIC GRAVITY (30°C)	(0.910)	(0.906)	(0.911)	(0.905)	(0.9111)	(0.907)	(0.909)	(0.907)	(0.907)	(0.912)
FATTY ACID COMPOSITION (%) 14:0	0.3±0.2	0.5±0.3	0.4±0.3	0.3±0.2	0.3±0.1	0.4±0.3	0.5±0.1	0.3±0.2	0.3±0.1	0.4±0.1
16:0	10.6±	12.9±3.4	12.6±1.9	13.9±2.8	13.4±1.3	11.2±2.1	12.1±2.5	10.8±3.2	11.8±1.7	12.2±2.2
16.1	1.0±0.5	1.5±0.9	1.8±1.7	1.7±1.6	1.4±0.6	1.9±1.2	1.8±0.4	1.4±0.5	1.9±1.6	2.2±0.1
18:0	5.4±1.5	4.9±0.9	6.0±1.5	5.0±1.0	4.7±0.5	4.7±0.8	4.9±1.8	5.0±0.2	4.5±0.7	4.5±0.4
18:1	45.6±3.9	43.2±6.0	41.4±2.8	39.4±4.8	43.4±4.4	44.7±6.0	45.5±3.7	45.7±5.6	16.0±2.8	44.1±3.0
18:2	28.5±1.7	25.9±6.5	26.6±6.4	29.6±4.2	27.3±3.8	24.9±9.8	23.9±2.9	26.9±5.4	25.6±3.1	25.9±1.8
20:0	2.3±0.6	2.5±0.5	2.7±0.6	2.5±0.4	2.4±0.4	2.8±1.1	2.7±0.7	2.6±0.7	2.3±0.4	2.6±0.2
20:1	1.1±0.3	1.6±0.6	1.4±0.6	1.5±0.4	1.3±0.3	2.1±1.6	1.6±1.2	1.4±0.5	1.5±0.5	1.9±0.7
22:0	3.5±0.5	4.5±0.5	4.4±1.1	4.4±1.1	4.0±0.3	4.6±2.1	4.1±1.5	3.8±0.1	3.7±0.4	3.9±0.4
24:0	1.8±0.6	2.5±0.8	2.7±0.1	1.9±0.7	1.7±0.5	2.8±1.4	2.2±1.5	2.3±0.1	2.3±0.7	2.4±0.6
Total Saturated acids (%)	23.9	27.8	28.8	25.9	26.5	26.5	26.5	24.5	25.0	26.0
Total Unsaturated acids (%)	76.1	72.2	71.2	72.2	73.5	73.5	73.5	75.5	75.0	74.0
COLOUR (Lovibond Colour Units) 1" cell										
Yellow	1.3	2.1	1.9	1.4	1.1	1.0	1.0	1.1	1.0	1.0
Red	6.0	8.0	7.3	5.0	4.2	3.5	3.6	3.8	3.5	3.4

TABLE 2: IDENTITY CHARACTERISTICS OF GROUNDNUT OIL SAMPLES

VARIETIES		KIDANG	SUNGAI SIPUT	EQ. RED	SPANETTE	TAINAN	GADJAH	MENG–LEMBU	PBI–9	F334–33	MOKET
CODE		A	B	C	D	E	F	G	H	I	J
SLIP MELTING POINT (°C)		9.0±0.6	9.7±0.3	10.0±0.3	10.5±0.2	10.1±0.1	10.0±0.5	10.1±0.5	11.1±0.5	10.2±0.2	10.2±0.5
WIJ'S IODINE VALUE (g of I_2/100 g of oil)		89±4 (94)	92±2 (94)	93±3 (94)	91±1 (93)	92±3 (95)	94±2 (95)	94±2 (96)	93±2 (94)	94±2 (95)	90±5 (96)
SAPONIFICATION VALUE (mg of KOH/g of oil)		(185)	(185)	(183)	(188)	(189)	(189)	(190)	(190)	(197)	(188)
REFRACTIVE INDEX AT 40°C		1.4635± 0.0002 (1.4636)	1.4631± 0.0001 (1.4623)	1.4631± 0.0001 (1.4628)	1.4631± 0.0001 (1.4619)	1.4651± 0.0001 (1.4622)	1.4639± 0.0001 (1.4632)	1.4635± 0.0001 (1.4627)	1.4639± 0.0001 (1.4628)	1.4634± 0.0001 (1.4628)	1.4838± 0.0001 (1.4630)
SPECIFIC GRAVITY (30°C)		(0.910)	(0.906)	(0.911)	(0.905)	(0.9111)	(0.907)	(0.909)	(0.907)	(0.907)	(0.912)
FATTY ACID COMPOSITION (%)	14:0	0.3±0.2	0.5±0.3	0.4±0.3	0.3±0.2	0.3±0.1	0.4±0.3	0.5±0.1	0.3±0.2	0.3±0.1	0.4±0.1
	16:0	10.6±2.8	12.9±3.4	12.6±1.9	13.9±2.9	14.4±1.3	11.2±2.1	12.1±2.5	10.8±3.2	11.8±1.2	12.2±2.2
	16:1	1.0±0.5	1.5±0.9	1.8±1.7	1.7±1.6	1.4±0.6	1.9±1.2	1.8±0.4	1.4±0.5	1.9±1.6	2.2±0.4
	18:0	5.4±1.5	4.9±0.9	6.0±1.5	5.0±1.0	4.7±0.5	4.7±0.8	4.9±1.8	5.0±0.2	4.5±0.7	4.5±0.4
	18:1	45.6±3.9	43.2±6.0	41.4±2.8	39.4±4.8	43.4±4.4	44.7±6.0	45.5±3.7	45.7±5.6	16.0±2.8	44.1±3.0
	18:2	28.5±1.7	25.9±6.5	26.6±6.4	29.6±4.2	27.3±3.8	24.9±9.8	23.9±2.9	26.9±5.4	25.6±3.1	25.9±1.8
	20:0	2.3±0.6	2.5±0.5	2.7±0.6	2.5±0.4	2.4±0.4	2.8±1.1	2.7±0.7	2.6±0.7	2.3±0.4	2.6±0.2
	20:1	1.1±0.3	1.6±0.6	1.4±0.6	1.5±0.4	1.3±0.3	2.1±1.6	1.6±1.2	1.4±0.5	1.5±0.5	1.9±0.2
	22:0	3.5±0.5	4.5±0.5	4.4±1.1	4.1±1.1	4.0±0.3	4.6±2.1	4.1±1.5	3.8±0.2	3.7±0.4	3.9±0.4
	24:0	1.8±0.6	2.5±0.8	2.7±0.1	1.9±0.7	1.7±0.5	2.8±1.4	2.2±1.5	2.3±0.1	2.3±0.7	2.4±0.6
TOTAL SATURATED ACIDS (%)		23.9	27.8	28.8	25.8	26.5	26.5	26.5	24.5	25.0	26.0
TOTAL UNSATURATED ACIDS ACIDS (%)		76.1	52.2	71.2	72.2	73.5	73.5	73.5	75.5	75.0	74.0

TABLE 3: QUALITY CHARACTERISTICS OF GROUNDNUT OIL SAMPLES

VARIETIES	KIDANG	SUNGAI SIPUT	EQ. RED	SPANETTE	TAINAN	GADJAH	MENG–LEMBU	PBI–9	F334–33	MOKET
CODE	A	B	C	D	E	F	G	H	I	J
FREE FATTY ACIDS (% as OLEIC ACID)	(1.6±0.1)	(2.0±0.1)	*(3.0±0.1)	(1.0±0.1)	(1.4±0.1)	(1.9±0.1)	*(2.2±0.1)	*(3.1±0.1)	(1.6±0.1)	(1.3±0.1)
UNSAPONIFIABLE MATTER (g/kg of oil)	(5.5)	(6.6)	(5.5)	(5.3)	(4.6)	(5.6)	(4.1)	(3.3)	(12.8)	(3.3)
COLOUR (LOVIBOND COLOUR UNITS) 1" CELL										
YELLOW	1.3	2.1	1.9	1.4	1.1	1.0	1.0	1.1	1.0	1.0
RED	6.0	8.0	7.3	5.0	4.2	3.5	3.6	3.8	3.5	3.4

* Values outside Codex Alimentarius No. CAS/RS–21–1969 for groundnut oil.
( ) Determination carried out on oil samples obtained by cold extraction.

determined the slip melting point. There appears to be a significant difference in the slip melting point of the oils extracted from the varieties Kidang (9.0° ± 0.6°C) and PBI–9 (11.1 ± 0.5°C). The oils extracted from all other varieties have slip melting points intermediate between these two values.

The codex specifies the range of I.V. as 80–106. This relatively low range places the groundnut oil among the so called non-drying oil which show good resistance to oxidation.

The I.V. of the oil extracted from all varieties of groundnut are within the range specified in the codex. There is also no significant difference between the I.V. of the oils extracted from different varieties *(Table 1)*.

The codex specifies maximum A.V. of virgin oil equivalent to 4 mg KOH/g of oil (Equivalent to 2% FFA as oleic acid). The results of the FFA determination carried out on the oils extracted by cold extraction method are shown in *Tables 2* and *3*. The oils extracted from varieties *Equatorial Red* (3.9 ± 0.1%); *Menglembu* (2.2 ± 0.1%) and *PBI 9* (3.1 ± 0.1%) have FFA outside the maximum limit given in the codex. The oils extracted from other varieties have FFA within the maximum limit.

FFA, although an important quality parameter, is not an inherent characteristic of the oil but depends upon the age and the conditions under which the groundnuts are stored after the harvest. It is possible that the oil from the three varieties viz. *Equatorial Red, Menglembu* and *PBI–9*, if extracted from fresh nuts may have lower FFA values. These results therefore, have to be treated with caution.

Only the oil extracted from three varieties *Kidang* (185), *Sungai Siput* (195) and *Equatorial Red* (183) have saponification values outside the range specified in the codex i.e. (187 – 196).

Only one determination was carried out on each sample. No statistical analysis was therefore, carried out. It is possible that the values for these oil samples are lower because of the experimental error. Moreover the difference of 2–4 unit is very small. The values of the oils extracted from other varieties are within the range specified in the codex.

The unsaponifiable matter in groundnut oil mainly consists of sterol, tocopherol and other antioxidant, sequalene and other hydrocarbons and some unidentified materials (7). The amount of unsaponifiable matter present in an oil affects the refining process and also the loss during refining. Codex specifies a maximum of 10 g/kg of oil. The oil extracted from one variety viz. *F334–33* (12.8 g/kg) has value exceeding this maximum. The value for the oils extracted from all other varieties are well within the maximum limit *(Table 1)*.

The indices of the oils extracted from all the varieties are within the range specified in the codex *(Table 2)*. The R.I. of the oil obtained from variety Tainan (1.4651 ± 0.0001) is significantly higher than the R.I. of the oils obtained from other varieties.

The codex specified the relative density at 20°C, whereas we have determined the specific gravity at 25°C/25°C as 0.910 – 0.915 (COCKS an REDE, 1966). Our results therefore, cannot be compared directly with the values given either in the codex or in the standards recommended by AOCS.

Since the Refractive Indices of the oil samples are comparable to the value given in the codex it would be logical to conclude that the specific gravity determined at 25°C/25°C would also be comparable.

In groundnut oil the fatty acids generally consist of 17–28% saturated and 72–83% unsaturated fatty acids. The former are mostly palmitic, but significant

amount of stearic, arachidic, behenic and lignoceric are also present. Among the unsaturated fatty acids, oleic acid predominates and because of this, groundnut oil shows good resistance to oxidation.

The typical G.L.C. analysis of groundnut oils from two important growing areas is shown below:–

Fatty Acid	Nigerian (%)	Argentinian (%)
C16:0	10.0	11.0
C18:0	3.5	3.0
:1	59.0	39.0
:2	20.0	38.0
:3	0.5	0.5
C20:0	1.5	1.5
:1	1.5	1.5
C22:0	2.5	3.5
C24:0	1.5	2.0

The proportion of linoleic (C18:2) to oleic acid (C18:1) also varies appreciably in groundnut oils from different sources.

Source	Saturated	Oleic (C18:1)	Linoleic (C18:2)
Spain	22	53	25
Philippines	18	55	27
W. Africa	18	65	17
Senegal	15	66	19

The oils extracted from almost all the varieties have very similar fatty acid composition, except the oil extracted from *Kidang* which has slightly higher unsaturated fatty acid content, and consequently has the lowest slip melting point *(Table 2)*.

The oils extracted from varieties *Kidang, Sungai Siput* and *Equatorial Red* appear to have higher red colour than the oils extracted from the other varieties. The method of colour measurement by Lovibond tintometer is a subjective method and therefore given widely different results. To measure colour accurately by tintometer the operators have to be trained using standard colour slides.

The difference between the colour values of the oils from different varieties is not very high, and therefore these values are not of great significance in terms of the quality of the oils produced from these varieties.

CONCLUSION

Assuming that the agronomic considerations for the cultivation of all the groundnut varieties evaluated are the same and are also acceptable, then for the selection of the variety best suited for oil extraction, the following points should be taken into consideration.

1. Oil content (yield).
2. Ease and economics of refining the extracted oil, and
3. Suitability of the extracted oil for the desired application.

On the basis of oil content (% dry basis), the varieties evaluated can be put into three groups.

1. **Oil content 48.0 – 49.0%**
   Kidang
   Sungei Siput
   Spanette

2. **Oil content 46.0 – 47.0%**
   Equatorial Red
   Tainan
   Gadjah
   FBI. 9

3. **Oil content 45.0 – 45.5%**
   F 334–33
   Moket

The above grouping is only true if we assume that the yield of groundnuts per acre from all these varieties is the same. Therefore, before making a final selection, the yield of oil per acre should be calculated. We do not have the data to make these calculations.

A normal crude groundnut oil is not expected to show above 2% FFA (oleic acid). The oils from most of the varieties have FFA well within this value.

Apart from low FFA and colour values, for ease of refining, not more than 8.0 g/kg of oil of unsaponifiable matter is recommended. All the oils, except the one obtained from the variety F334–33, have unsaponifiable matter below this value.

In general groundnut oil is easy to refine and in view of the above, oil produced from all the varieties, except from *F334–33,* would be acceptable for refining.

The physical characteristics and the chemical composition of groundnut oil make it most suitable compared to those generally used as liquid oil in the composition of margarine. When derived from sound nuts it is easily refined to give a pale yellow oil of pleasant mid bland flavour. Because of the intermediate I.V. (80–106) and high oleic acid content it shows good resistance to oxidation and therefore, it is preferred for cooking and as an ingredient in many food products. Its use is however, restricted because of the comparatively higher price it fetches in the World Market for the manufacture of margarine and spreads.

The oil from all the varieties evaluated is suitable both as cooking oil and for the manufacture of margarine and spreads.

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SUMMARY

Groundnut samples from 10 varieties grown in Malaysia supplied by the field crop branch of MARDI were analysed for moisture and oil content. The oils extracted from these nuts were analysed for physico-chemical characteristics. The oils extracted from most of these nuts have low FFA, colour value and unsaponifiable matters and therefore would be acceptable for refining. The oil content in these nuts varies from 45% – 49%.

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