RAPESEED OIL IN CANADIAN EDIBLE OIL PRODUCTS

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In 1977 low-erucic acid RS oil surpassed SB oil to become the largest single component of edible oil products in Canada. RS oil represented 36.3% of the total vegetable oil used, vs SB at 34.9%, palm oil 8.7%, corn oil 6.4%, cocoanut 5.5%. This situation has not developed by chance but instead it has resulted from the combined efforts of many people and groups, including the growers, government agencies, universities, the RS Association of Canada, the crushers and the refiners. This paper is intended to give a brief overview of the processing and utilization of RS oil, as seen by one Canadian refiner.

95% of the shipments of crude, degummed RS oil received by Canada Packers between July '77 and March '78 met the present specs. of: FFA, 1.0% max.; refined, bleached, colour, 1.5 Red, max.; neutral oil, 98.5% min. Unfortunately a fairly high proportion of the shipments exceeded the spec. for phosphorus (P) of 200 ppm max. Except for phosphorus many of the shipments also met proposed, morestringent specifications. Erucic acid levels were well below the 5% max. Canadian crushers are continuing their efforts to improve oil quality, particularly to achieve lower contents of P- and S-compounds. The former will be achieved by better degumming. Modified extraction techniques, combined with the increased availability of low-glucosinolate seed, should result in lower S-levels.

The standard, well-known processes are used by Canadian refiners: i.e. H_3PO_4 addition, alkali-refining, bleaching, hydrogenation, (where applicable), deodorization. The adverse effect of trace amounts of P- and S-compounds are well recognized, hence the emphasis on reducing their contents in the crude, degummed oil. Simple, rapid, accurate, methods of analysis for P and S are needed. The Anacon MECA technique is useful for P analyses. P levels above approx. 150 ppm can be determined in duplicate in about 10 mins. For levels of 2 - 5 ppm about 30 mins. are required.

Although physical refining of RS oil is used to only a very limited extent, if at all, in Canada at present the advantages of this process make it attractive. These are lower capital costs, lower material costs, lower costs for handling effluent. In addition,nickel catalyst usage for hydrogenation should be reduced.

Margarine oils and shortenings may contain up to 60 - 70% of RS oil without difficulty. At higher levels recrystallization will present problems which may be alleviated by the addition of palm oil. The use of 0.1 - 1.0% of sorbitan tristearate is usually more effective.

In conclusion it may be said that although RS oil has had more than its share of problems, it has established itself as the pre-eminent oil in Canada. Its quality is being up-graded continuously. It is expected that in the longer term the plant breeders will succeed in improving the fatty acid composition by increasing the levels of palmitic and linoleic acid and decreasing that of linolenic acid. As a result of the continuing efforts of the various groups working effectively together there is every reason to be confident that RS oil will maintain and strengthen its position.

TABLE I

RAPESEED AND RS OIL: CANADA 1977

Total crop	1.46 million hectares	(a)
Total crop (seed)*	1.78 million tonnes	(a)
Oil equivalent	0.71 million tonnes	
Oil: edible use in Canada	0.12 million tonnes	(b)
Oil: estimated production, 1978	0.16 million tonnes	(a)

* 32% from 00 varieties, principally

(a) RS Digest; (b) Statistics Canada

TABLE II

QUALITY OF CRUDE, DEGUMMED RS OIL

Criterion	Present[1] Spec.	Suggested Limits Now	Suggested Limits Future	Actual analyses[2] 95%	Actual analyses[2] Extreme
FFA (% as oleic)	1.0	0.7	0.5	0.4 - 0.9	1.0
Bl. Col. (R)	1.5	1.5	1.0	0.4 - 1.5	2.5
Neutral Oil (%)	98.5	98.7	99.0	98.6 - 99.3	98.1
P (ppm)[3]	200	100	50	140 - 315	450
S (ppm)[3]	-	10	5	2 - 15	25
P.V. (m.e.)	-	1.5	1.0	0.3 - 2.5	2.8

[1] Specs. are max. except for Neutral Oil which is min.

[2] Shipments received by Canada Packers Limited: July '77 - March '78

[3] Method of Daun D.K. and F.W. Hougen, JAOCS 53: 169 (1976)

TABLE III

MARGARINE-OIL FORMULAS

Type	Component	%	SFI 10°C	SFI 21.1°C	SFI 33.3°C
Print	Hydro RS	60	8	2	-
	Hydro SB	40	50	40	15
	Formula	100	26	14.5	2.5
Soft	Hydro RS*	70	5	1	-
	Hydro SB	30	60	50	30
	Formula	100	12	7.5	2.5

* Unhydrogenated RS may be used.