

## BIOREFINING OF RICE BRAN OIL

TABLE 5

Effect of Temperature on the Extent of Deacidification of Degummed and Dewaxed Rice Bran Oil in Biorefining Process

Temperature in C	Reaction time in hr	% FFA in oil	Lovibond color (1 cm cell)	
			Y	R
			Condition: i) Glycerol—theoretical amount ii) Enzyme—10% on the wt of oil iii) Pressure—10 mm Hg iv) Water—10% on the wt of enzyme	
50	1	14.7	—	—
	2	12.0	—	—
	5	8.8	—	—
	7	8.2	—	—
	10	7.9	13.4	2.5
70	1	10.8	—	—
	2	8.5	—	—
	5	4.7	—	—
	7	3.6	—	—
	10	3.5	9.0	2.2
80	1	15.1	—	—
	2	14.3	—	—
	5	8.8	—	—
	7	6.9	—	—
	10	5.0	10.0	2.3

TABLE 6

Characteristics of Crude and Refined Rice Bran Oil Samples

	FFA %	Unsap. %	MG %	DG %	TG %	Lovibond color (1 cm cell)	
						Y	R
Crude rice bran oil	30.0	4.0	1.2	12.5	53.3	27.0	4.0
Biorefined oil	3.6	2.0	1.3	12.8	80.3	9.0	2.2
Biorefined and alkali refined oil <sup>a</sup>	0.1	2.0	1.0	12.5	84.0	5.0	0.6

<sup>a</sup>Refining factor of the oil is 1.2.

encouraging. The reaction has occurred either between the glycerol used and the FFA or between the DG and the FFA. Quite likely both of the two esterification reactions have taken place simultaneously because the DG content in the crude and the biorefined sample is nearly

the same and the TG content in the refined sample is significantly increased.

The combined biorefining and alkali refining process compares well in terms of refining factor and color with the miscella refining process regarding hexane (1) and a hexane-alcohol mixture (2) as shown previously in our laboratory and is by far superior to the combined physical refining and alkali neutralization process investigated by the authors in respect to the refining characteristics. The refining factor includes the total per cent loss of oil from the stages of biorefining and alkali refining divided by the FFA of the crude oil.

The overall results obtained in the present study and the fact that the energy required is much lower compared to other processes can suggest that high FFA rice bran oil can be refined with a high degree of economy by a combination of enzymatic deacidification and alkali neutralization.

## ACKNOWLEDGMENT

The authors thank the Council of Scientific and Industrial Research for providing funds and NOVO INDUSTRI, Denmark, for the enzyme, Lipozyme T<sup>M</sup>.

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[Received February 28, 1989; accepted June 1, 1989]  
[J5673]

## ERRATUM

This article, "Biorefining of High Acid Rice Bran Oil," by S. Bhattacharyya and D.K. Bhattacharyya which appeared in the October issue of *JAOCs* (66:1469-1471), appears here in full reprint due to the omission of several paragraphs in the originally printed article.