



# Palm, palm kernel and coconut oils

World Conference to study production, characteristics and uses of each

The AOCS/PORIM World Conference on Processing of Palm, Palm Kernel and Coconut Oils to be held Nov. 11-16, 1984, in Kuala Lumpur, Malaysia, will provide a thorough study of the three oils that have been of increasing interest in the world fats and oils trade.

Palm oil's increasing share of world trade has been a major development during the past two decades. Twenty years ago, world trade was around 600,000 metric tons a year. Now world trade is around 4 million metric tons a year. Total world palm-oil production two decades ago was about 1.25 million metric tons, but now is more than 6 million metric tons and may reach 22 million metric tons in another 20 years. Palm-oil production spurted briefly a few years ago with the introduction of a pollinating weevil to oil palm plantations, but this was followed the next year by a decline in production attributed variously to a stress reaction to the weevil's use, climatic conditions and reduced use of fertilizer.

The oil palm produces two distinct oils. Palm oil is crushed from the tree's fruit, palm kernel oil from the fruit kernels. Oil palm is grown commercially in Malaysia, Indonesia and its native West Africa, although Malaysia is now the world's leading producer of palm oil. Brazil and other Central and South American countries also are planning extensive oil palm acreage (Table I).

The phenomenal development of Malaysia's oil palm

industry dates from the late 1950s when intensive government-financed research helped to develop the crop as an alternative to the country's sole exports of rubber, tin and timber. Most of Malaysia's palm oil is now refined before export, with Europe, England and the United States being the major customers.

Palm oil contains a total of 50% saturated fatty acids and displays good stability at high temperatures. It is a semisolid product, needing little hydrogenation, and finds its greatest use as a shortening and frying fat, although it is also used in margarines, bakery fats and ice cream products.

Palm kernel oil yield from the kernels of a fresh fruit bunch is about 10% that of palm oil. Malaysia, Nigeria and Indonesia are the major producers; Western Europe and the EEC, Singapore, and the Soviet Union are among major importers (Table II). Palm kernel is a lauric oil. It is used in the manufacture of confectionery fats and bakery goods as well as other products requiring short-chain fatty acids.

Processors and users of palm oil would like to see plant geneticists develop an oil palm yielding oils with improved stability, revised crystalline properties to produce a smoother textured hydrogenated oil or a less saturated, more liquid crude oil. Recent success in "cloning" oil palms may mean plantations with trees yielding 50% more oil than is common now.

Coconut oil production has not increased as

# TUMOR LIPIDS:

## BIOCHEMISTRY AND METABOLISM

Edited by Randall Wood, Department of Medicine and Biochemistry, University of Missouri School of Medicine, Columbia, Missouri, this 6½ by 10-inch hard-bound volume is the first book published by the American Oil Chemists' Society.

### CHAPTER TITLES INCLUDE:

1. ROLE OF FREE FATTY ACID AND LIPO-PROTEINS IN THE LIPID NUTRITION OF TUMOR CELLS
2. FATTY ACIDS AS METABOLIC FUELS OF CANCER CELLS
3. DEFECTIVE CONTROL OF CHOLESTEROL SYNTHESIS AND THE DEVELOPMENT OF LIVER CANCER: A REVIEW
4. REGULATION OF CHOLESTEROL SYNTHESIS IN HTC CELLS (MINIMAL DEVIATION HEPATOMA 7288C)
5. THE POSSIBLE ROLE OF CHOLESTERYL 14-METHYLHEXADECANOATE IN THE TUMOR GROWTH
6. PHOSPHOLIPID TURNOVER IN NORMAL AND CANCER CELLS
7. NORMAL AND NEOPLASTIC HUMAN BRAIN TISSUES: PHOSPHOLIPID, FATTY ACID AND UNSATURATION NUMBER MODIFICATIONS IN TUMORS
8. A COMPARATIVE STUDY OF LECITHINS FROM YOSHIDA HEPATOMA AH130, MORRIS HEPATOMA 5123C AND HOST RAT LIVERS
9. MOLECULAR STRUCTURES OF TUMOR LECITHINS AND THEIR RELEVANCE TO SOME PROPERTIES OF TUMOR CELL MEMBRANES
10. PLASMA MEMBRANE LIPIDS OF NORMAL AND NEOPLASTIC TISSUES
11. TUMOR LIPIDS: STRUCTURAL AND METABOLISM STUDIES OF EHRLICH ASCITES CELLS
12. THE ROLE OF ACYL DIHYDROXYACETONE PHOSPHATE IN TUMOR LIPID METABOLISM
13. LIPID METABOLISM IN NORMAL AND TUMOR CELLS IN CULTURE
14. LIPIDS AND LIPID METABOLISM OF NOVIKOFF RAT HEPATOMA CELLS
15. PROTEOLIPIDS ASSOCIATED WITH MALIGNANCY
16. GLYCOLIPIDS IN VIRAL ENVELOPES
17. ALTERED GLYCOLIPID METABOLISM RELATED TO VIRAL TRANSFORMATION OF ESTABLISHED MOUSE CELL LINES
18. GLYCOLIPIDS—THEIR CHEMICAL PATTERN, SYNTHESIS AND DEGRADATION IN NORMAL AND TUMOR CELLS
19. GLYCOSPHINGOLIPIDS OF CLONAL LINES OF TRANSFORMED MOUSE FIBROBLASTS AND MOUSE ADRENOCORTICAL CELLS

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## Meetings

TABLE I

Palm Oil (1000 tons)

Country	Production	Imports	Exports	Total Domestic Use
<b>Cameroun</b>				
1979	81	0	6	75
1982	105	0	12	93
1984	90	0	10	80
<b>China (Mainland)</b>				
1979	93	42	0	135
1982	112	19	0	131
1984	110	15	0	125
<b>Colombia</b>				
1979	70	0	0	70
1982	87	0	0	87
1984	110	0	0	111
<b>West Germany</b>				
1979	0	175	14	156
1982	0	142	21	123
1984	0	192	20	172
<b>India</b>				
1979	0	398	4	374
1982	0	435	0	435
1984	0	370	0	370
<b>Indonesia</b>				
1979	641	0	351	297
1982	838	0	240	576
1984	950	0	300	660
<b>Iraq</b>				
1979	0	140	0	141
1982	0	186	0	186
1984	0	160	0	168
<b>Ivory Coast</b>				
1979	124	0	49	75
1982	157	0	62	95
1984	170	0	55	115
<b>Japan</b>				
1979	0	139	0	139
1982	0	148	0	142
1984	0	170	0	170
<b>Malaysia</b>				
1979	2,189	0	1,901	214
1982	3,512	0	2,829	428
1984	3,800	0	3,090	480
<b>Netherlands</b>				
1979	0	167	57	107
1982	0	151	56	90
1984	0	190	70	120
<b>Nigeria</b>				
1979	500	13	0	513
1982	525	153	0	678
1984	535	175	0	710
<b>Pakistan</b>				
1979	0	203	0	203
1982	0	220	0	230
1984	0	335	0	355
<b>Singapore</b>				
1979	0	518	492	26
1982	0	541	502	39
1984	0	415	395	20
<b>United Kingdom</b>				
1979	0	229	1	228
1982	0	186	0	186
1984	0	225	0	225
<b>United States</b>				
1979	0	142	0	133
1982	0	113	0	113
1984	0	160	0	178
<b>USSR</b>				
1979	0	105	0	103
1982	0	354	0	354
1984	0	310	0	310
<b>Zaire</b>				
1979	173	0	0	173
1982	175	0	5	170
1984	157	0	4	153
<b>World</b>				
1979	4,267	2,869	2,935	4,077
1982	6,006	3,689	3,962	5,474
1984	6,483	3,861	4,100	6,063

# Meetings

dramatically as that of palm and palm kernel oils, but it historically is an important oil in world trade. Anticipated shortages in recent months have fueled rapid price increases, an indication of its importance to users worldwide. Its chemical composition is similar to that of palm kernel oil.

World coconut oil production is around 2.5 million metric tons, with the Philippines being the world's major producer and dominant exporter. Indonesia, the world's No. 2 producer, no longer exports coconut oil. The coconut was established as a crop in the Philippines during the 18th and 19th centuries. In the early 20th century, experiment stations and agricultural schools provided the impetus that made coconut the nation's most important economic crop.

Coconut palms produce fruit for about 70 years, with each tree yielding an average of 40 nuts per tree per year. On the Philippine island of Mindanao, yields have

reached 100 nuts per tree. Hybrid coconuts have been developed, but replacement of traditional trees has been occurring at a relatively slow pace.

The United States is the single largest importer of coconut oil, taking about 404,000 metric tons during 1982. EEC imports that year were about 500,000 metric tons.

Coconut oil contains a high percentage of saturated acids, particularly lauric and myristic acid. Besides its use in confectionery fats, margarine and shortening, coconut oil is used for deep-fat frying of nuts and snacks. Coconut oil is used extensively in soap and as a feedstock for fatty acids and derivatives.

World conference organizers have developed a program that will provide a general overview of world markets and trade, followed by presentations on each oil's properties, how the oils are obtained from coconuts and fresh fruit bunches of oil palm, how the oils are

TABLE II

Palm Kernel Oil (1000 tons)

Country	Crush	Production	Imports	Exports	Total Domestic Use
Benin					
1979	69	32	0	10	22
1982	70	33	0	10	23
1984	70	33	0	11	22
France					
1979	7	3	16	0	19
1982	0	0	35	0	36
1984	0	0	55	0	52
West Germany					
1979	5	3	29	4	25
1982	0	0	34	1	35
1984	0	0	45	2	43
Indonesia					
1979	74	35	0	0	32
1982	133	63	0	3	63
1984	162	76	0	0	76
Malaysia					
1979	459	196	0	198	0
1982	806	338	0	333	7
1984	1,040	437	0	410	20
Netherlands					
1979	35	17	70	20	68
1982	0	0	93	28	64
1984	0	0	100	30	70
Nigeria					
1979	100	48	0	51	10
1982	150	70	23	40	56
1984	160	75	0	40	35
United Kingdom					
1979	52	24	61	1	84
1982	66	31	61	1	91
1984	70	30	50	0	80
United States					
1979	0	0	79	0	79
1982	0	0	95	0	95
1984	0	0	100	0	100
Zaire					
1979	45	20	0	18	2
1982	68	31	0	17	14
1984	56	26	0	17	6
World					
1979	1,101	497	350	331	523
1982	1,589	703	502	469	742
1984	1,883	826	554	548	825

# Meetings

processed and how they are used in edible and industrial products.

Plenary lectures will be held each day at the world conference with informal discussion sessions afterward to provide registrants with a chance to question the speakers or comment on the session topics. Registrants will have an opportunity on Thursday, Nov. 15, to visit nearby palm oil and palm kernel oil processing facilities. Malaysia boasts some of the world's most modern oil processing facilities.

An exposition by suppliers of equipment and services to the fats and oils industries will be held during the conference, providing registrants with a chance to see the latest offerings by these organizations.

Kurt Berger of PORIM and Dave Tandy of EMI Inc. of the United States have served as cochairmen of the

program committee during the past three years. Working with an international steering committee, they have tailored a program to provide the most useful information available about these oils. The tentative technical program is printed at the conclusion of this article.

Registration forms and other information are available from the AOCS, 508 S. Sixth St., Champaign, IL 61820 USA, or from PORIM, P.O. Box 10620, Kuala Lumpur, Malaysia. Singapore Airlines is official airlines for the meeting, with special rates for persons traveling to this meeting from North America, Europe or elsewhere in Asia.

The world conference is the week after the 1984 World Congress of the International Society for Fat Research, which is scheduled for Nov. 4-9, 1984, in New Delhi, India.

**TABLE III**  
Coconut Oil (1000 tons)

Country	Crush	Total Production	Imports	Exports	Total Domestic Use
France					
1979	53	34	45	8	72
1982	0	0	88	11	78
1984	0	0	96	11	85
India					
1979	335	207	5	0	212
1982	330	205	14	0	219
1984	325	202	10	0	212
Indonesia					
1979	956	624	27	21	609
1982	1,105	674	1	0	672
1984	1,020	622	0	0	622
Malaysia					
1979	205	125	1	66	60
1982	208	127	2	64	65
1984	208	129	2	81	65
Mexico					
1979	120	76	0	0	71
1982	100	54	7	0	64
1984	100	55	10	0	64
Netherlands					
1979	62	38	53	31	61
1982	0	0	102	33	66
1984	0	0	100	20	75
Philippines					
1979	1,578	994	0	795	186
1982	1,978	1,246	0	949	221
1984	1,714	1,080	0	915	200
Sri Lanka					
1979	163	100	0	32	68
1982	140	87	0	39	48
1984	146	91	0	40	51
United States					
1979	0	0	444	5	407
1982	0	0	404	10	415
1984	0	0	430	10	439
World					
1979	4,074	2,577	1,156	1,092	2,595
1982	4,597	2,842	1,267	1,266	2,809
1984	4,096	2,549	1,175	1,192	2,599

Data from USDA Foreign Agricultural Service, March 1984.

World figures include all nations, not only the major countries listed above.

# AOCS/PORIM

## World Conference on

# Processing of Palm, Palm Kernel & Coconut Oils

Tentative Technical Program

(as of March 1, 1984)

Monday, November 12, 1984

- 08.30**      **Opening Session**
- 10.00**      **Coffee break**
- 10.30**      **Session I - General Overview**  
 Chairmen: Yusof Basiron, Palm Oil Research Institute of Malaysia, Kuala Lumpur, Malaysia  
 A. Richard Baldwin, American Oil Chemists' Society, Champaign, Illinois, USA
- Present and Future Position of Palm and Palm Kernel Oils in World Supply and Trade  
 S. Mielke, *Oil World*, Hamburg, West Germany

Present and Future Position of Coconut Oil in World Supply and Trade

Leonard F. Ignacio Jr., United Coconut Association of the Philippines, Manila, Philippines

Contribution of Biological Research to the Development of the Oil Palm Industry

A.T. James, Unilever Research, Sharnbrook, England

Contribution of Biological Research to the Development of the Coconut Industry

W. Padolina, University of the Philippines at Los Banos College, Laguna, Philippines

Present and Prospective Developments in the Palm Oil Processing Industry

M.S.A. Kheiri, PORIM, Bangi, Malaysia

12.45

**Discussion**

13.20

**Lunch**

14.50

**Session II - Properties of Oils**

Chairmen: S.H. Ong, Palm Oil Research Institute of Malaysia, Kuala Lumpur, Malaysia

Marshall Pike, Harrisons & Crosfield Ltd., Camberley Surrey, England

Composition of Oils

J.B. Rossell, Leatherhead Food Research Association, Leatherhead, England

Biological Modification of Oil Composition

B.K. Tan, Palm Oil Research Institute of Malaysia, Kuala Lumpur, Malaysia

Composition of Nonglyceride

Dr. S.H. Goh, University of Malaya, Kuala Lumpur, Malaysia

Physical Properties of Oils

Ralph Timms, Kempas Edible Oil Sdn. Bhd., Pasir Gudang, Malaysia

16.15

**Discussion**

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# Meetings

Tuesday, November 13, 1984

08.30

**Session III - Processing of Fruit**

Chairmen: Lim Kang Hoe, H&C Oil Palm Research Station, Banting, Malaysia

Jules Yetka, Anderson International Corporation, Cleveland, Ohio, USA

**Palm Oil and Palm Kernels**

Aziz Zakaria, FELDA, Kuala Lumpur, Malaysia

**Palm Kernel Oil**

Tang Thin Sue, Palmex Industries Sdn. Bhd., Prai Penang, Malaysia

**Coconut Oil**

Mr. Montenegro, Pacific Activated Carbon, Manila, Philippines

09.40-10.10 **Coffee break**

**Pollution Control in Oil Mills**

Ma Ah Ngan, PORIM, Kuala Lumpur, Malaysia

**Automation in Oil Mills**

Mr. Sivasothy, PORIM, Bangi, Malaysia

**Quality Control in Fruit Processing**

Teoh Gean Eng, FELDA, Kuala Lumpur, Malaysia

**Energy Considerations**

H.K. Jorgensen, United Plantations, Perak, Malaysia

11.35

**Session IV - Oil Processing**

Chairmen: Teoh Kah Tin, Palmex Industries Sdn. Bhd., Prai Penang, Malaysia

Ragnar Ohlson, AB Karlshamns Oljefabriker, Karlshamn, Sweden

**Chemistry of Refining**

P.A.T. Swoboda, PORIM, Kuala Lumpur, Malaysia

**The Bleaching Process**

David Morgan, Laporte Industries Ltd., Widnes, England

Comprehensive New Volume—AOCS Monograph 10

## Dietary Fats and Health

Edited by E. G. Perkins & W. J. Visek

This new AOCS monograph is the proceedings of a conference held in Chicago in December 1981. Containing 60 chapters by leading scientists in biochemistry and nutrition, the book presents the latest scientific information in fat chemistry and technology related to nutrition. Specifically, it covers the general role of fats in nutrition, metabolism of isomeric fats, and the role of vitamins A, D, E and K in health and disease. Included are controversial topics such as the role of lipids in heart disease and cancer, and the effects of diet on high density lipoproteins and the techniques of lipoprotein fractionation. The book also contains information devoted to emerging research on dietary fats and nutrition in such areas as multiple sclerosis and the immune response. Numerous illustrations and references are found throughout.

**Subjects include:**

Chemistry and Technology of Fats  
New Methodology in Fat Analysis  
Nutritional Effects of Fats, and Metabolism

Essential fatty acids  
Pre- and post-natal development  
Isomeric fats

Vitamins A,D,K,  
Immune response  
Heart Disease

Epidemiology  
Diet

Lipoproteins  
structure  
effects of diet on  
fractionation  
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diet and cholesterol  
relation to cancer

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# Meetings

The Physical Refining Process  
Hermann Stage, ATT Verfahrenstechnik GmbH, Münster, West Germany

Quality Control in Oil Processing  
Susumu Sato, Nisshin Oil Mills, Yokohama, Japan

Energy Considerations  
Gunnar Haraldson, Alfa-Laval, Tumba, Sweden

13.30 Lunch  
14.50 Discussion

## Wednesday, November 14, 1984

### 08.30 Session V - Industrial Uses of Palm Kernel and Coconut Oils

Chairmen: C.Y. Wong, Lam Soon Oil & Soap Mfg. Sdn. Bhd., Petaling Jaya, Selangor, Malaysia  
Rodolpho Jimenez, United Coconut Chemicals Inc., Manila, The Philippines

Trends in Industrial Uses of Palm and Lauric Oils

Juergen Knaut, Henkel KGaA, West Germany

Processing for Industrial Fatty Acids (I)  
Durfee L. Combs, Emery Industries, Cincinnati, Ohio, USA

Soap Production—Palm and Lauric Oil Products

Daini Saika, Lion Corporation, Tokyo, Japan

### 09.50-10.20 Coffee break

Other Oleochemical Uses—Palm Oil Products  
Yoshiteru Akaike, Nippon Oil, Amagasaki-Shi, Japan

Other Oleochemical Uses—Lauric Products  
Morimichi Tanigunchi, Kao Corporation, Tokyo, Japan

### 11.45 Session VI - Industrial Uses of Palm, Palm Kernel and Coconut Oils

Chairmen: S. Nakasato, National Chemical Laboratory for Industry, Yatabe, Japan

William F. Bernholz, BBK Inc., Andover, New Jersey, USA

Processing for Industrial Fatty Acids (II)  
Su Ann Ooi and H. Kee Pee, Acidchem, Butterworth, Malaysia

Pharmaceutical and Cosmetic Uses of Palm and Lauric Products

Speaker to be confirmed

Industrial Fatty Acids, Fatty Alcohols and

Fatty Amines for Various Applications  
Richard A. Reck, AKZO Chemie America, Chicago, Illinois, USA

Quality Requirements from a Consumer's Point of View  
F. de Waet, Oleofina, Brussels, Belgium

13.15 Lunch  
14.45 Discussion

## Thursday, November 15, 1984

### 08.30 Session VII - Modification Processes

Chairmen: Ralph Timms, Kempas Edible Oil Sdn. Bhd., Pasir Gudang, Malaysia  
Robert C. Hastert, Harshaw/Filtrol Partnership, Cleveland, Ohio, USA

Interchangeability of Fats and Oils  
F. Vernon K. Young, Vernon Young Consultant Ltd., Liverpool, England

Fractionation of Palm Oil  
Etienne Deffense, S.A. Fractionnement Tirtiaux, Fleurus, Belgium

Fractionation of Lauric Oils  
J. Barry Rossell, Leatherhead Food Research Association, Leatherhead, England

Hydrogenation of Palm and Lauric Oils  
B. Grothues, Walter Rau Neusser Oel und Fett AG, Neuss, West Germany

### 09.50-10.20 Coffee break

Interesterification of Palm and Lauric Oils  
Stephen J. Laning, Stokely-Van Camp Inc., Columbus, Ohio, USA

Enzyme Processes of Modifying Fats and Oils  
Rajindra Angja, Cornell University, Ithaca, New York, USA

### 11.40 Discussion

### Afternoon Visits to industrial and technical sites

## Friday, November 16, 1984

### 08.30 Session VIII - Edible Products of Palm, Palm Kernel and Coconut Oils

Chairmen: Joseph Moolayil, Lever Bros. (M) Sdn. Bhd., Kuala Lumpur, Malaysia  
Robert Delaschmit, Palmco Inc., Portland, Oregon, USA

Palm Oil in Margarines and Shortenings  
M. Duns, Unilever (M), Kuala Lumpur, Malaysia

Palm Oil Products in Cooking Fats  
M.S.A. Kheiri, PORIM, Bangi, Malaysia

# Meetings

Other Food Uses—Palm Oil, Palm Kernel Oil in Food Products

H. Traitler, Nestlé, La Tour de Peilz, Switzerland

## 09.55-10.25 Coffee break

Confectionery Fats from Palm Oil and Lauric Oil

Tsuguo Izumi, Fuji Oil, Osaka, Japan

Coconut Oil in Food Products

Speaker to be confirmed

## 11.15 Session IX - Maintenance of Quality for Palm and Lauric Oil Products

Chairmen: S. Krishnan, Unitata Bhd., Teluk Intan, Malaysia

B. Chapman, Pure Lard Trading (UK) Ltd., Westerham, England

Additives

Speaker to be confirmed

Quality Control in Storage and Transport of Edible Oil

Kurt G. Berger, PORIM, Kuala Lumpur, Malaysia

The Role of the Surveyor

S. Subramaniam, SGS India Pvt. Ltd., Bombay, India

Quality Requirements from a Consumer's Point of View (Food Products—Japan)

Masanori Sonehara, Miyoshi Oil, Tokyo, Japan

Quality Requirements from a Consumer's Point of View (Food Products—Europe)

Marcel Willems, Croklaan b.v., Wornerveer, The Netherlands

## 13.25 Lunch

## 15.00 Discussion

## 16.10 Summary of Technical Papers

A Richard Baldwin, American Oil Chemists' Society, Champaign, Illinois, USA

## 16.50 Closing ceremonies

## 17.20 Adjournment

Kernel and Coconuts Oils will have an opportunity to tour Kuala Lumpur and surrounding areas.

On Monday, Nov. 12, the spouses' tour of Kuala Lumpur will include a stop for a traditional puppet show as well as a Malay lunch with a fashion show.

On Tuesday, Nov. 13, an all-day tour to historic Malacca is scheduled.

On Wednesday, Nov. 14, the Batu Caves tin mines will be the attraction, with a chance to view the work of silver and tin craftsmen.

On Thursday, Nov. 15, a trip to the highlands outside Kuala Lumpur, with a possible alternate trip to the new 25-acre headquarters of the Palm Oil Research Institute of Malaysia (PORIM), are available.

## Henkel invitation

Overseas registrants attending the AOCS/PORIM World Conference on Processing of Palm, Palm Kernel and Coconut Oils are invited by officials of Henkel Oleochemicals to attend the official opening of Henkel's new \$12 million downstream oleochemical plant in Malaysia.

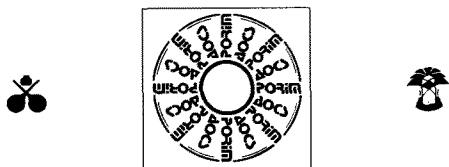
The event will be held Saturday, November 17. Details will be available at the conference.

The plant is a joint venture between Henkel and Jomalina Sdn Bhd and Socoil Corporation Bhd. The plant produces fatty acid methyl ester, fatty acids and glycerine. Jomalina and Socoil are Malaysian palm oil refiners. They will provide the palm and palm kernel oil to the Henkel Oleochemicals (M) Sdn Bhd facility for processing into oleochemicals. Annual capacity at the plant is 25,000 tons. Palm oil can be processed to yield oleochemicals similar to those derived from tallow; palm kernel oil is similar in composition to coconut oil.

Production at the plant was scheduled to begin in April 1984. The official opening ceremonies will mark the plant's achieving full operational status.

## Call for Papers

Abstracts are being accepted for the Fourth International Symposium on High Performance Liquid Chromatography of Proteins, Peptides and Polynucleotides, which will be held December 10-12, 1984, at the Hyatt Hotel on the Inner Harbor, Baltimore, Maryland. Deadline for submission of papers is August 1, 1984. Topics at the symposium will include column technology and support materials, micropreparative techniques and recovery of biological activity, HPLC of polynucleotides, membrane proteins, HPLC analysis of amino acids, analytical applications of HPLC, scale-up and process-level preparative chromatography, multistep and multidimensional chromatographic techniques and clinical applications. Abstract forms are available from Symposium Manager, Shirley Schlessinger, Fourth International Symposium on HPLC of Proteins, Peptides and Polynucleotides, 400 E. Randolph, Chicago, IL 60601.



## Spouses Program

Spouses accompanying technical registrants for the AOCS/PORIM World Conference on Processing of Palm, Palm