

Palm Oil Research and Technical Service Institute of the Malaysian Palm Oil Board (PORTSIM)

Goh Eng Meng*

INTRODUCTION

China is the largest importer of Malaysian palm oil for the last seven consecutive years. As the largest importer, it is important to Malaysia that China continues to import and use palm oil. One of the ways to ensure that China continues to import Malaysian palm oil is to establish closer ties with the Chinese palm oil users and customers. The establishment of the Palm Oil Research and Technical Service Institute of MPOB (PORTSIM) in 2005 in China is to enhance the Malaysian palm oil presence in China and to establish closer ties with the oils and fats industry in the country (*Figures 1 and 2*). The establishment of PORTSIM will help to expand the application of palm oil, and hence, further increase the imports of Malaysian palm oil products into China. PORTSIM's presence in China will also put Malaysia in a better position to effectively disseminate palm oil information and provide technical advisory services to the Chinese customers.

PORTSIM is located at Yuanshan Road, occupying the first and second floors of a business centre in the Shanghai Euromate City Industrial Park at Xinzhuang Industrial Park, about 30 km south-west of the Shanghai City Centre. The then Minister of Plantation Industries and Commodities, Malaysia, Datuk Peter Chin Fah Kui, officiated the opening of PORTSIM on 13 December 2005. A seminar on palm oil was also held in Shanghai in conjunction with the opening ceremony which was attended by

more than 200 guests from China and Malaysia (*Figure 3*).

OBJECTIVES OF ESTABLISHING PORTSIM

The objectives of establishing PORTSIM are:

- to carry out R&D collaborations/contract research with Chinese universities/research centres as well as in-house projects;
- to carry out advisory services visits to provide technical support and analytical services to users of Malaysian palm oil in China;
- to conduct technical training programmes and seminars for the promotion and extension of technologies in palm oil utilization in China;

- to become a Palm Oil Information Centre; and
- to establish closer rapport between our Chinese customers and MPOB.

FACILITIES AND SERVICES

PORTSIM has acquired facilities for research work and analytical services. Two laboratories are equipped with analytical and testing facilities (*Figure 4*), capable of providing the analytical services listed in *Table 1*. An experimental kitchen equipped with baking and frying facilities has also been set up for end-use food application experiments (*Figure 5*).

STAFF

Currently, PORTSIM has a total workforce of 12 staff, consisting of a general manager, a principal research officer, five technical officers, two accounts assistants, an administrative assistant and two supporting staff (*Figure 6*).

RESEARCH PROGRAMMES AND ACTIVITIES

Research Advisory Committee (RAC)

The Research Advisory Committee (RAC) was formed in March

* Palm Oil Research and Technical Service Institute of Malaysian Palm Oil Board (PORTSIM), 18, Lane 88, Yuanshan Road, Xinzhuang Industrial Park, Minhang, 201108 Shanghai, P R China.
E-mail: engmeng_goh@mpob.gov.my



Figure 1. Map showing the location of PORTSIM.



Figure 2. Palm Oil Research and Technical Service Institute of MPOB (PORTSIM) in Shanghai, P R China.



Figure 3. Official opening of PORTSIM and seminar.

2007. The main objectives of the RAC are to advise on the research programmes of PORTSIM, related activities of the oil palm/palm oil industry and any other matters related to the functions and activities of PORTSIM. The RAC was established to assist PORTSIM in achieving its objectives of enhancing the usage and applications of palm oil in China through its research programmes and activities. The first meeting of RAC was held from 29-30 March 2007 at PORTSIM during which the Committee evaluated new project proposals and approved five collaborative projects. The second RAC meeting was held from 13-14 March 2008 at PORTSIM office during which the Committee reviewed the progress of the five on-going projects.

Technical (R&D) Collaboration

PORTSIM has established contacts for technical collaboration with Chinese universities, research institutes and enterprises. Five collaborative projects approved by RAC have been implemented and are due for completion in 2009 (Table 2).

The projects, *Evaluation of Frying Oils in the Fast Food Industry*, *Development of Vegetable Lard Substitute in Bakery Products* and *Palm-Based Special Oils for Quick-frozen Food and Frozen Bread Dough* are expected to result in partial or total replacement of soyabean oil and lard in the relevant products by palm oil-based products. This will lower the cost of raw materials for the manufacturers, and will extend the utilization of palm oil in the Chinese food industry, increasing the import and consumption of Malaysian palm oil products in China. A scientific paper, *Palm-based Special Oil for Bakery*

TABLE 1. ANALYTICAL AND TESTING FACILITIES AT PORTSIM

Equipment/Apparatus	Service/Analysis
1. Agilent gas chromatograph	1.1 Fatty acid composition (FAC) of oils and fat products. 1.2 Triglyceride composition (TG) by carbon number. 1.3 <i>Trans</i> fatty acid content.
2. Foss near-infrared (NIR) analyser	2.1 Free fatty acid (FFA). 2.2 Iodine value (IV). 2.3 Peroxide value (PV). 2.4 Moisture and impurities (M&I).
3. Oxford solid fat content (SFC) NMR analyser	3.1 SFC of oils and fats. 3.2 Oil content in snack foods.
4. Agilent HPLC system	4.1 Triglyceride composition. 4.2 Cholesterol content. 4.3 β -carotene. 4.4 Vitamin E (tocopherols/tocotrienols). 4.5 Antioxidants.
5. Melting point apparatus	5.1 Slip melting points of oils and fats.
6. Titration apparatus and general laboratory apparatus	6.1 Free fatty acid (FFA). 6.2 Iodine value (IV). 6.3 Peroxide value (PV). 6.4 Moisture and impurities (M&I).
7. Lovibond tintometer	7.1 Colour of oil and fat products.

TABLE 2. PROJECTS UNDERTAKEN BY PORTSIM

Project title	Name of collaborator
1. <i>Development of Vegetable Lard Substitute in Bakery Products.</i>	Changsha University of Science and Technology (CUST).
2. <i>Palm-based Special Oils for Quick-frozen Food and Frozen Bread Dough.</i>	Henan University of Technology (HUT).
3. <i>Evaluation of Frying Oils in the Fast Food Industry.</i>	A fast food restaurant in Shanghai.
4. <i>Application of Palm Kernel Cake (PKC) in Feed for Dairy and Beef Cattle.</i>	China Agricultural University (CAU) and Beijing Jinniu Weiye Sci & Tech Development Co., Ltd.
5. <i>Utilization of Palm Kernel Cake (PKC) in Aquaculture.</i>	Putuo Tongzhou Bio-Environ Engineering Co., Ltd (PTBEC).



Figure 4. Analytical instruments.



Figure 5. Kitchen facilities.

Frozen Dough will be published in the journal, *China Oils and Fats*.

The two other projects on the application and utilization of PKC in the feed for dairy and beef cattle, and in aquaculture, respectively, will offer less expensive feed formulations for the feed manufacturers. Thus, more PKC will be utilized in the Chinese feed products.

Technical Support and Promotional Activities

In line with technical support and promotion to create awareness in palm oil and to expand the utilization of palm oil products, the following activities which include the organization of trade fairs, seminars, exhibitions and workshops have been carried out.

• **Malaysia-China Palm Oil Trade Fair and Seminar 2006.** The Malaysia-China Palm Oil Trade Fair and Seminar 2006 organized by the Malaysian Palm Oil Council (MPOC) and MPOB were successfully held from 26-28 July 2006 at the Pudong Shangri-La, Shanghai, China (Figure 7). Datuk Peter Chin Fah Kui, the then Minister of Plantation Industries and Commodities, Malaysia, senior officials of MPOB and MPOC, and Mr Wang Lie, Vice Chairman of the China Council for the Promotion of International Trade (CCPIT) Shanghai, were present at the opening ceremony. About 400 participants were also present. This

event featured a combination of a seminar, an exhibition and business meetings. More than 20 companies participated in the exhibition.

This Malaysia-China Palm Oil Trade Fair and Seminar has successfully enhanced the image of palm oil in China. At the same time, it provided market information on oils and fats industry to both domestic and foreign participants. The seminar and trade fair also highlighted the development of palm oil in China, and strengthened the networking between Malaysian and Chinese business communities. In addition, the seminar enhanced trade relationships as well as forged



Figure 7. Opening ceremony of the Malaysia-China Palm Oil Trade Fair and Seminar 2006, Shanghai.

ORGANIZATION STRUCTURE OF PORTSIM

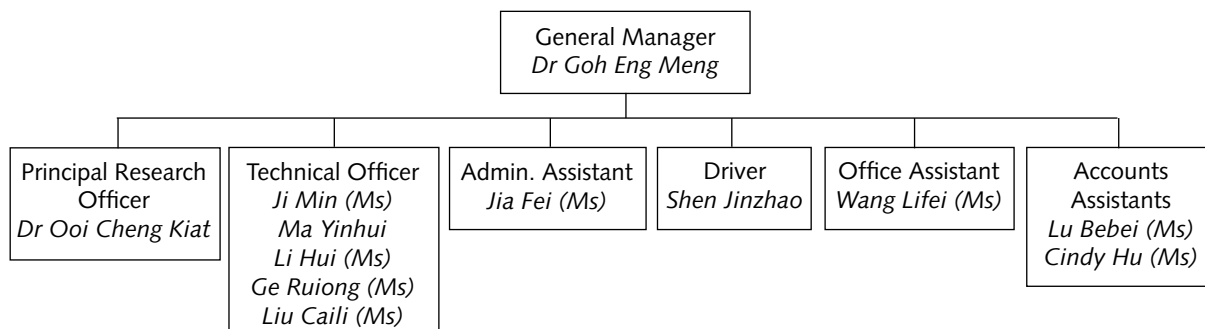


Figure 6.

new linkages between the players in the Malaysian palm oil industry and the buyers and traders in China.

• **Rohm & Haas Biodiesel Seminar.** PORTSIM/MPOB and Rohm & Haas (China) jointly organized a biodiesel seminar on 4 September 2007 at the R&D Centre of Rohm & Haas in Pudong, Shanghai (Figure 8). The Seminar was well attended by 80 participants who showed keen interest in palm biodiesel. A paper, *An Overview of Raw Materials for Biodiesel Production, with Special Reference to Palm Oil*, was presented.

The Seminar introduced palm oil as a competitive raw material and MPOB technology for biodiesel production to the existing and potential Chinese biodiesel manufacturers. The participants were able to gain a better understanding of the techno-economic advantages of palm oil vis-à-vis rapeseed and soyabean oils as the raw material for the production of biodiesel.

• **Palm Discovery Tour.** PORTSIM collaborated with Tourism Malaysia in organizing the inaugural Palm Discovery Tour from 25-30 August 2007, to coincide with Visit Malay-

sia Year 2007 and Malaysia's 50th Merdeka anniversary. A total of 15 Chinese businessmen from the oils and fats/oleochemicals/cosmetic products industries participated in this event. They visited MPOB Head Office and Southern Edible Oil Industries (M) Sdn Bhd (covering plantation, mill and refinery), and had a fruitful evening of interaction with Datuk Yong Ah Pwi, the President, and some members of the Malaysia-China Chamber of Commerce in Kuala Lumpur (Figures 9 and 10).

The Palm Discovery Tour achieved its objectives of providing opportunities to the participants for exposure to the Malaysian palm oil industry and for enhancing their understanding of the economic and technical aspects of palm oil. The interaction with the Malaysia-China Chamber of Commerce provided an opportunity for networking and establishing future business co-operation between Malaysia and China. It also offered the participants the opportunity to attend PIPOC 2007.

• **Palm Oil Food Uses (POFU) Workshop on Baking.** PORTSIM organized the Palm Oil Food Uses (POFU) Workshop on Baking on 28



Figure 8. Rohm & Haas Biodiesel Seminar 2007, Shanghai.



Figure 9. Participants of the Palm Discovery Tour.



Figure 10. Interaction with members of the Malaysia-China Chamber of Commerce.



Figure 11. The Palm Oil Food Uses (POFU) Workshop 2007, September 2007, PORTSIM office.

September 2007 at PORTSIM (Figure 11). The workshop on baking was to introduce and promote the utilization of palm oil products in Chinese baked foods. It also aimed at creating awareness and understanding in palm oil and its versatile uses. It acted as a forum to create business opportunities between China and Malaysia. The Workshop was attended by 30 participants, and the following five papers were presented:

- a. *Malaysian Palm Oil Industry and the Role of MPOB/PORTSIM in China* by Dr Goh Eng Meng (PORTSIM);
- b. *The Application of Palm Oil and Palm Kernel Oil*

with Special Reference to Baking by Prof. Weng Xinchu (Shanghai University, College of International Exchange);

- c. *The Chinese Experience in the Use of Palm Oil in Snack Food* by Dr Yang Tiankui (Dalian University of Technology);
- d. *The Advantages of Palm Oil in Cake Making* by Zhang Yafei (Sino-Foreign Shanghai Kingmar Oil Foods Co., Ltd); and
- e. *The Functions of Palm Oil in Bread and Cookie Products* by Shen Hua, (Bakemark International Company).

The POFU Workshop created awareness not only in the suitability of palm products for baking, but also the advantages of palm oil in cake making. Palm-based vegetable lard substitutes, which are cheaper and healthier, can be used to replace (totally or partially) lard in bakery food applications, especially in Chinese traditional cookies.

• **Oils & Fats International (OFI) China 2007 Conference & Exhibition.** PORTSIM/MPOB participated at the OFI China 2007 Conference & Exhibition organized by the Malaysian Oil Scientists' and Technologists' Association (MOSTA) and the Oils & Fats International (OFI) on 11-12 September 2007 at Dongfang Hotel, Guangzhou (Figure 12). A paper, *Highlighting Semi-solid Applications of PO, PKO and Blends – Specific SFC Targets* was presented.

The participation of MPOB/PORTSIM at OFI China 2007 sought to inform the Chinese about MPOB and the role of PORTSIM in China. The presentation on *Semi-solid Application of PO, PKO and Blends* provided the participants an insight on the specific solid fat content (SFC) requirements of

PO, PKO and blends for various applications.

• **Shandong Enterprise-University-Research Institute Collaboration Exhibition & Talk.** PORTSIM/MPOB also participated in the Shandong Enterprise-University-Research Institute Collaboration Exhibition & Talk in Jinan, Shandong Province in May 2006 and May 2008 (Figure 13). Palm oil information was disseminated and products were displayed at the exhibition. The participation of PORTSIM in Shandong was to inform the participants

about Malaysian palm oil, MPOB and PORTSIM.

The event assisted in the promotion of MPOB/PORTSIM and palm oil, particularly in Shandong and its neighbouring provinces. It also created an opportunity to establish contacts for future technical cooperation between MPOB and Chinese universities, research institutes and enterprises.

• **APEC Biofuels Summit, Qingdao.** A paper, *Biofuel Development Programme in Malaysia* was presented at the APEC Biofuels Sum-



Figure 12. Oils & Fats International (OFI) China 2007, September 2007, Guangzhou.



Figure 13. Shandong Enterprise-University-Research Institute Collaboration Exhibition & Talk, May 2008, Jinan.



Figure 14. APEC Biofuels Summit, June 2008, Qingdao.

mit, Qingdao, China from 1-3 June 2008 (Figure 14).

The APEC Biofuels Summit provided an opportunity to keep abreast of the developments in biofuels in other countries, and also for MPOB to promote palm oil as an ideal raw material and MPOB technology for the production of biodiesel.

• In-house Training for Damin Foodstuff (Zhangzhou) Co., Ltd. Damin Foodstuff (Zhangzhou) Co., Ltd. in Zhangzhou, Fujian Province, invited PORTSIM to give an in-house training talk in Chinese on the uses of palm oil, particularly on the application of palm oil in non-dairy creamer and other food products, to the staff of Damin on 30 June 2008 (Figure 15).

Various food applications of palm oil products, particularly in non-dairy creamer, were introduced to Damin Foodstuff Co., Ltd. Damin has shown interest in a joint POFU Workshop on Powder Fats, for the promotion of palm-based powder fats for beverages, soups and other food applications.

• Jilin-Changchun Exhibition. PORTSIM and MATRADE jointly

participated in the 4th China Jilin International Investment & Trade Expo held in Changchun, Jilin Province, from 2-6 September 2008 (Figure 16).

• Palm Oil Trade Conference. At the Palm Oil Trade Conference, organized by CBI (Shanghai) Co., Ltd and held in Shanghai from 25-26 September 2008, PORTSIM was invited to speak on the current production and supply of palm oil in Malaysia.

• Working Visit to China by the Chairman and Deputy Director-General (R&D) of MPOB. During a working visit to Shanghai in March 2008, Dato' Sabri Ahmad, Chairman of MPOB, and Dato' Dr Choo Yuen May, Deputy Director-General (R&D) of MPOB, visited PORTSIM on 20 March 2008 (Figure 17). They were briefed by the General Manager of PORTSIM, on the objectives of establishing



Figure 15. In-house training, June 2008, Zhangzhou.



Figure 16. The 4th China Jilin International Investment & Trade Expo, 2-6 September 2008, Changchun, Jilin Province.



Dato' Sabri Ahmad and entourage at PORTSIM.



Dato' Sabri Ahmad tasting dough-sticks at a collaborator's restaurant.



At the Ecomat project site.



At the Daxing cattle feedlot site.

Figure 17.

PORTM, its vision and mission, and the activities of PORTSIM. They also visited a fast food restaurant with which PORTSIM is collaborating in a project on the use of palm oil to replace soyabean oil for frying Chinese dough-sticks.

In addition, Dr Khalid Haron, Research Officer from MPOB accompanied Dato' Sabri and Dato' Dr Choo during the working visit to Beijing where they visited the Ecomat project site at Shunyi, the Ministry of Science and Technology,

Tsinghua University, the China, National Offshore Oil Corp and the Institute of Nutrition and Food Safety.

During the trip, Dato' Sabri and Dato' Dr Choo also visited the cattle feedlot at Daxing Beef Cattle Base where the collaborative project, *Application of Palm Kernel Cake (PKC) in the Feed for Dairy and Beef Cattle* is currently underway. Dato' Sabri was briefed by Prof Qingxing Meng, Director of the Administration Board of China

Agricultural University Beef Cattle Research Centre, on the progress of the project. Dato' Sabri was impressed with the positive results of the PKC trials obtained thus far. From this project, two papers on nutritive value of palm kernel cake and ruminant degradability of its main nutrients, and effect of supplement of palm kernel cake in beef cattle diets on growth performance and feed cost, have been written for publication in the *Chinese Journal of Animal Science*.