

PALM OIL ABSTRACTS

A.GENERAL: OILS AND FATS

A00019

Contract conditions. In *Oils and Fats International* 1991 4: 29-32.

This is a follow-up report on the move towards restoring previous cargo conditions in the regulations and contracts for the shipment of oils and fats for edible or oleochemical use. It reviews the status of the rules in place and the progress being made towards a single set of global trading conditions for international movements.

KEYWORDS: FUTURES CONTRACTS/TRANSPORT/OILS AND FATS SURVEYING

A00020

World oilseed situation and outlook. In *Oil Crops* 1991 31: 7-10.

World oilseed output is forecast to jump 2.2% to a record 222.4 million tonnes in 1991/92, with increases recorded for all major oilseeds except sunflower and flax. Global oilseed crush is forecast to increase slightly to 180 million tonnes, while trade in oilseeds has not changed much from last year in response to a slow-down in demand in the USSR and Eastern Europe.

KEYWORDS: PALM OIL/OILS AND FATS INDUSTRY/SOYA BEAN OIL INDUSTRY-America

A00021

MCCORMICK, I; HOSKIN, R. Canola: Prospects for an emerging market. In *Oil Crops* 1991 31: 18-23.

Canola, a type of rapeseed, has attracted considerable attention in recent years from consumers and potential producers. Although domestic use and production are expanding, there is no clear consensus on how the role of canola will evolve in the United States. Product characteristics, competition from other oilseeds, price, yield risk and Federal trade and farm policies are key factors to consider.

KEYWORDS: CANOLA OIL/OIL MEAL/RAPESEED OIL/OILS AND FATS INDUSTRY-America/PALM OIL

A00022

MIELKE, T. 1991/92 supply and demand outlook for 11 oils and butter. Annual Conference of the International Association of Fish Meal Manufacturers, Berlin, Germany, 31 October 1991. In *Oil World 1991* Vol 34(44): 367-372.

The paper reviews the situation in fish oil as well as special features of the current vegetable oil market, such as prospective Soviet imports, the shortage in Europe (despite the bumper rape crop), the growing shortage of supply of lauric oils and the burden of low stocks of oils and fats at the start of the 91/92 season.

KEYWORDS: OILS AND FATS INDUSTRY/PRODUCTION FORECASTS/PALM OIL

B. OIL PALM

Cultivation. Crop Management. Plant Protection. Plant Science. Breeding and Genetics. Biotechnology

B00047

ARIFFIN Darus; IDRIS Abu Seman; ABDUL HALIM Hassan, Dato Dr Hj. Histopathological studies on colonization of oil palm root by *Ganoderma boninense*. In *Elaeis* 1991 Vol 3(1): 1-10.

Histopathological investigations on roots naturally diseased by infection with *Ganoderma boninense* suggest that the fungus is a vascular pathogen. Infection of the xylem vessels preceded the appearance of the pathogen in surrounding cells. The pathogen caused severe plugging of the vessels, which may account for the symptoms of impairment of water uptake in infected palms. No evidence of a host reaction by formation of tyloses to restrict fungal movement was observed in infected vessels. The pathogen was not tissue specific and was present in all tissue types at the advanced stage of pathogenesis.

KEYWORDS: OIL PALM DISEASES/BASAL STEM ROT

B00048

HENSON, I E. Use of leaf temperature measurements for detection of stress conditions in oil palm. Paper presented at a workshop on Developments in Tropical Crop Physiology: Physiological and Environmental Constraints, UPM Serdang, 27 - 28 August 1991. In *Transactions of the Malaysian Society of Plant Physiology* Vol. 2 MSPP: 51-57.

Leaf temperature measurements have been successfully used to characterize crop drought stress in semi-arid climates. In humid tropical climates the technique may be less readily applicable owing to the restricted diurnal range of vapour pressure deficit. In oil palm, radiation level has a large influence on leaf temperature and leaf-air temperature difference, which consequently show large temporal variation. Nevertheless, it is possible to detect and partly quantify crop stress provided a well-watered crop is available to provide a reference. Examples are given, for young oil palm, of effects of water stress on leaf air temperature difference and its relationship to stomatal conductance and to soil water deficit.

KEYWORDS: OIL PALM-Climatology/TEMPERATURE-Measurement/CROP STRESS/OIL PALM LEAVES/PLANT PHYSIOLOGY and METABOLISM/RADIATION

B00049

AHMAD TARMIZI Hashim; MARZIAH M. Proline accumulation in oil palm polyembryonic cultures under stress conditions induced by growth limitation treatments. Paper presented at a workshop on Developments in tropical crop physiology: Physiological and Environmental Constraints, UPM Serdang, 27-28 August 1991. In *Transactions of the Malaysian Society of Plant Physiology* Vol. 2 MSPP: 89-94.

Various treatments limiting growth were applied to oil palm (*Elaeis guineensis*) polyembryonic cultures in order to maintain the cultures for medium-term *in vitro* storage. Some of these treatments induced stress conditions which affected the development of the cultures. It was found that proline accumulated in the cultures during incubation at

low temperature and high osmotic pressure (sucrose). However, there were no changes in proline content in cultures stored in liquid media. This observation revealed that proline accumulation can be used as a stress indicator for oil palm polyembryogenic cultures in some conditions and this could be exploited in understanding the stress tolerance mechanism in future studies.

KEYWORDS: OIL PALM POLYEMBRYOGENIC CULTURES/*IN VITRO* CULTURE/

C.PALM OIL

Chemistry. Product Development and Quality. End Uses. By-Product Utilization.

C00044

OH Flingoh C H; ZUKARINAH Kamarudin. Wideline nuclear magnetic resonance for measuring the oil content of palm mesocarp. In *Elaeis* 1991 Vol 3(1): 311-316.

Wideline nuclear magnetic resonance (WLNMR) spectrometer has been used to measure the oil content of palm mesocarp. The WLNMR was calibrated using crude palm oil, and a factor to correct the signal readings due to non-oil components of mesocarp was introduced into the calibration equation. Mesocarp from *tenera* palm fruits was cut and dried in either a conventional drying oven or a microwave oven. The dried mesocarp was then ground and the NMR signal of a known amount of sample was taken after tempering at 70°C for 30 minutes. The percentage of oil in the mesocarp was then calculated and the value was compared with that obtained by Soxhlet extraction. The results showed that WLNMR could be used to measure the oil content in the mesocarp rapidly, and that the measuring time was much shortened with microwave drying.

KEYWORDS: NUCLEAR MAGNETIC RESONANCE(NMR)/PALM OIL MESOCARP/SOXHLET/CALIBRATION

C00045

OOITian Lye; LEONG Wan Leong. Adsorption of palm oil monoglycerides using rice husk ash. In *Elaeis* 1991 Vol 3(1): 317-323.

It is shown that monoglycerides can be selectively adsorbed onto rice husk ash from crude palm oil-hexane miscella or crude palm oil. The adsorbed monoglycerides were identified by gas chromatography and GC/MS. The major fatty acids of the monoglycerides were found to be palmitic and oleic. In model experiments, 0.2% (w/w) of monopalmitin added to refined, bleached and deodorized palm olein could be removed completely using rice husk ash; about 48 micromol or 15.84mg of monopalmitin were adsorbed by one gram of ash.

KEYWORDS: MONOGLYCERIDES/GAS CHROMATOGRAPHY(GC)/PALM OIL/RICE HUSKS/ ADSORPTION

C00046

SIEW Wai Lin; TAN Yew Ai; CHONG Chiew Let. Iodine value of palm kernels/palm kernel oil. PORIM Report PO (00198)91.

Some possible factors affecting the iodine value of palm kernels and palm kernel oil were investigated. The iodine value of the oil is affected by the size of the kernels as there is a difference in iodine value between oil extracted from the inner and outer sections of the kernel. The amount of broken shells can contribute to a slight increase in iodine value of the kernel oil. Seasonal variation is an important factor and shows significant correlation with iodine value: the kernel oil produced during the months of October to December shows a higher iodine value than other months. Between mills, the variation in iodine value is affected by a combination of factors such as size of kernels and processing conditions, assuming that the mill processes fruits from similar planting material. Fruit maturity and age of the palm do not affect the iodine value of the oil.

KEYWORDS: PALM KERNELS/PALM KERNEL OIL/ IODINE VALUE/QUALITY PARAMETERS/PALM OIL-QUALITY/PALM OIL MILLS

C00047

YOSHIDA, H; TATSUMI, M; KAJIMOTO, G. Relationship between oxidative stability of vitamin E and production of fatty acids in oils during microwave heating. In *JAOCS* 1991 Vol 68(8): 566-570.

The effects of microwave heating on the oxidative stability of delta-tocopherols were studied in relation to the production of fatty acids in oils. During microwave heating, the stability of tocopherols decreased in the order $\sigma > \beta > \delta > \alpha$. This order did not depend on the types of ethyl esters of fatty acids or oils present. But, the shorter the chain length and the lower the degree of unsaturation of the fatty acid ethyl esters, the greater was the reduction in amount of individual tocopherols. A similar tendency was observed when tocopherol-stripped vegetable oils, with equimolar mixtures of tocopherols added, were treated under the same conditions. The reduction in tocopherols became greater with increasing levels of free fatty acids.

KEYWORDS: VITAMIN E/MICROWAVE HEATING / TOCOPHEROLS and TOCOTRIENOLS/OXIDATIVE STABILITY/PALM OIL/COCONUT OIL/SAFFLOWERSEED OIL

C00048

New CPO terminal aims at the growing export market. In *Asia Pacific Food Industry* 1991 9: 36-40.

Close economic cooperation has always been the hallmark of Dutch-Indonesian ties. Nowhere is this more evident than in the latter's burgeoning agribusiness industry – *i.e.* floriculture, poultry, horticulture and dairy – where increasing trade, investment and business partnerships between the two countries have become the norm. Recently, this special relationship was cemented even further when a Dutch group and its local partners clinched a contract to build Indonesia's most modern multi-million dollar crude palm oil (CPO) terminal on Batam Island.

KEYWORDS: PALM OIL SURVEYING/BULKING INSTALLATIONS/OILS AND FATS INDUSTRY-Indonesia/CPO/HANDLING

C00049

SUYS, I. Quality control for frying oils and fats: Correlation between polar compound content and viscosity. In *Rev Franc Des Corps Gras* 1991 Vol 38(7-8): 219-224. In French.

The correlation between polar compounds and viscosity was studied on 116 samples of heated frying fats and 113 samples of heated frying oils. With a second order equation, it is possible to estimate the polar compounds from the viscosity. The particular case of the acid fats is also studied.

KEYWORDS: FRYING OILS AND FATS/PALM OIL-Quality/FRYING PERFORMANCE

C00050

OOI Tian Lye; LEONG Wan Leong. The potential for the recovery and concentration of palm sterols using rice husk ash. Paper presented at the PORIM International Palm Oil Conference 1991: Progress, Prospects and Challenges Towards the 21st Century: Bangi: PORIM, 1991. Proceedings to be published by PORIM.

Sterols, both in mixture and as separated alcohols are used in many branches of industry, mainly in pharmaceutical and cosmetic areas. They are high valued products and are widely, for instance, used in synthesis of steroid hormones. Sterols are present in natural raw materials of animal and vegetable origin. The sterols content in crude palm oil and palm kernel oil are about 350 ppm and 1000 ppm respectively.

In this paper our experiments on the recovery and concentrating sterols to high purity from palm oil products using treated rice husk ash are discussed. Three experiments are used for illustration of this observation. The first experiment showed that more than 96% of stigmaterol could be recovered from 0.2% (wt/wt) of authentic stigmaterol added to distilled palm oil methyl esters at room temperature. The second experiment involved the recovery and concentration of sterols from a residue (RIME), obtained from a local oleochemical plant producing methyl esters based on palm kernel oil. The results indicate that our method provides a clean

separation of sterols from the residue, RIME. The purity percentage of the sterols was found to be >96% and the recovery of sterols was at least 75%. The third example involved the use of a pressed cake rich in sterols content (constitute about 70% of the total unsaponifiables) where the sterols could be purified to a purity of 86.7% to 92.1%.

KEYWORDS: STEROLS/RICE HUSKS/STEROIDS/ALCOHOLS/PALM OIL,CRUDE/PALM KERNEL OIL/METHYL ESTERS/OLEOCHEMICALS/PHARMACEUTICALS/

C00051

MOHAMAD Sulong. Current status of decanters for palm oil clarification. Paper presented at the Seminar on Developments in Palm Oil Milling Technology and Environmental Management, Genting Highlands, 16-17 May 1991.

This is a review of the current progress in the application of a three-phase decanter in a crude palm oil clarification plant. Field trial results indicated that the variations in throughput and composition are the major cause for the process instability within the decanter. Recent research effort in this area are confined to the development of a suitable control system to suppress process disturbances and maintain process stability to improve overall clarification plant efficiency.

KEYWORDS: PALM OIL-Processing and Milling/CLARIFICATION and CLARIFICATION TANKS

C00052

ABDULAZIS Ariffin. Chemical changes during sterilization process affecting strippability and oil quality. Paper presented at the Seminar on Developments in Palm Oil Milling Technology and Environmental Management, Genting Highlands, 16-17 May 1991. 16p.

Sterilization is an important preparative step for the extraction of palm oil, and this is where most chemical reactions occur. Good sterilization condition would enable fruits to be easily detached from the bunch. Chemi-

cal changes taking place in the fresh fruit bunches (FFB) during sterilization affect both strippability and oil quality. Changes pertaining to the carbohydrates of the bunch during sterilization are directly associated with strippability, whilst chemical changes in oil prior to sterilization affect oil quality.

KEYWORDS: PALM OIL-Processing and Milling/STERILIZATION and STERILIZERS/HYDROLYSIS/PALM OIL-Quality/FATTY ACID CONTENT/CAROTENES and CAROTENOIDS/TOCOPHEROLS and TOCOTRIENOLS

C00053

CHONG Chiew Let. An overview of the effects of milling practices and storage on the quality of crude palm oil. Paper presented at the Seminar on Developments in Palm Oil Milling Technology and Environmental Management, Genting Highlands, 16-17 May 1991. 28p.

Quality survey data over the last two decades have been reviewed to ascertain whether the quality of crude palm oil has improved over this period. Fruit condition and the effects of some unit milling processes in terms of FFA have been considered in relation to Loncin's hydrolytic equation. It is concluded that the milling process, in general, does not significantly increase the FFA of the final extracted oil. The level of FFA is determined more by the amount of fruit damage, delayed processing time and to a certain extent milling conditions in terms of time and temperature. There are also indications that secondary oxidation products may be formed during processing. In view of potential competition in the near future, all sectors of the palm oil industry are urged to aim for scheduled quality improvements without waiting for incentives.

KEYWORDS: PALM OIL, CRUDE/STORAGE/PALM OIL-Quality/FFA/PALM OIL-Processing and Milling/DETERIORATION/PALM OIL SURVEYING/STERILIZATION and STERILIZERS/HARVESTING

C00054

CHEAH Suan Choo. Microbiology of anaerobic digestion. Paper presented at the Workshop on Anaerobic Digestion, SIRIM Shah Alam, 5-7 August 1991. CP 00590

Anaerobic digestion, a microbiologically controlled process which occurs in several natural habitats, has been adopted as an effective means of waste treatment.

The process can be divided into two phases—non-methanogenic and methanogenic. The end product of the process is a mixture of gases, namely, methane, carbon dioxide and ammonia, which is commonly referred to as biogas. The synergistic activities of four groups of bacteria are responsible for the conversion of biomass to biogas. This paper describes the biochemistry and microbiology of these bacteria, including a case study made in a digester treating palm oil mill effluent.

KEYWORDS: MICROBIOLOGY/ANAEROBIC DIGESTION/POME-Treatment/BACTERIA/BIOCHEMISTRY/BIOGAS/PALM OIL MILL EFFLUENT (POME)

D. ENGINEERING AND TECHNOLOGY

Farm Mechanization. Palm Oil Surveying. Palm Oil Mill Engineering.

D00020

MAYCOCK, J H. Condensing turbines for power generation for palm oil mills: A new approach to power plant design. Paper presented at the Seminar on Developments in Palm Oil Milling Technology and Environmental Management, Genting Highlands, 16-17 May 1991. 12p.

The paper briefly describes the development of the power plants installed in palm oil mills since the early 1900s and then puts forward a new concept based on a high pressure boiler feeding a condensing turbine and a low pressure boiler with a steam accumulator for sterilizing and processing steam. The condensing turbine system installed at the KL-Kepong (Sabah) mill complex is then discussed.

KEYWORDS: TURBINES/PALM OIL MILLS/PALM OIL & OIL PALM INDUSTRY-Malaysia

D00021

SIVASOTHY, K. An analysis of the relative significance and interdependence of oil losses from pressing and clarification processes in a palm oil mill. Paper presented at the Seminar on Developments in Palm Oil Milling Technology and Environmental Management, Genting Highlands, 16-17 May 1991. 10p.

The paper analyses two important sources of oil loss in a palm oil mill, *i.e.* pressing and clarification processes, using the non-fat pressing quotient (NFPQ) concept. The data needed for the analysis were collected by monitoring the performance of a press station over a period of five days. Even though the oil loss during clarification tends to increase with a reduction in oil loss during pressing, overall oil losses from the two processes, under normal operating conditions, show a greater dependence on oil loss during pressing.

KEYWORDS: PALM OIL MILLS/OIL LOSSES/CLARIFICATION and CLARIFICATION TANKS/PALM OIL-Processing and Milling/PRESSING

E. NUTRITION

Dietary Fats. Cancer and Carcinogenesis. Coronary Heart Disease.

E00033

BABAYAN, V K. Medium chain triglycerides for food use. In Lipid Technology 1991 Vol 3(3): 92-94.

Medium chain triglycerides, or MCT, have still not reached their full potential for use in food products even though they have been successfully used in a range of specially formulated foods for patients unable to absorb the more common long chain fats and oils. The increased emphasis on health, diet and exercise may be the stimulus needed for development of a range of commercial MCT food products.

KEYWORDS: TRIGLYCERIDES/FOOD USES/MEDIUM CHAIN TRIGLYCERIDES(MCT)/DIETARY FATS/PALM OIL/NUTRITION

F.ECONOMIC

Production Costs. Socio-economics. Market Development. Futures Trading

F00029

Palm oil market in Kenya. In *Intisari Dagang* 1991 3:9.

Malaysian palm oil has made great inroads into the Kenyan vegetable oil market. Today, Malaysia is the leading supplier to this market, with palm oil accounting for 90% of the total vegetable oil imports, which amount to about US\$69 million per annum. Imports of palm oil increased from 96 000 tonnes in 1986 to 168 000 tonnes in 1990.

KEYWORDS: MARKET DEVELOPMENT/PALM OIL MARKETING/OILS AND FATS INDUSTRY-Kenya