

Highly Nutritious Satay* Sauce Made with Unrefined and Partially Refined Palm Oleins

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INTRODUCTION

Unrefined (crude) palm oil is the richest source of natural carotenes. The carotene content of Malaysian palm oil (in the unrefined form) ranges between 500 to 700 ppm. More than 55% of these carotenes are in the form of β -carotene. β -carotene is a precursor of vitamin A and is also responsible for the red colour of the unrefined palm oil. Currently, such an oil is used in a number of West African and South American countries for cooking purposes. A greater proportion of the carotenes are found in crude palm olein (liquid fraction) than in crude palm stearin (solid fraction). Foods cooked using red palm olein can be considered as value added products as their high β -carotene content makes them more nutritious.

**Note : Satay is barbecued meat/chicken widely eaten in Malaysia, Indonesia and Singapore. The sauce main ingredient is peanut plus other spices.*

Complementary to the growing interest in nutritional work relating to the role of β -carotene as an anti-cancer agent, some studies on the application of palm olein containing β -carotene in some food products have been carried out. This paper reports on its usage in satay sauce. Satay sauce was selected for the study due to its popularity. Satay is well-known, not only by Malaysians but also by other nationalities particularly in the ASEAN region. Satay sauce is red in colour thus the use of palm olein containing carotene would enhance its appearance.

Three different commercial samples of red palm olein namely unrefined or crude palm olein (CPOo), neutralized palm olein (nPOo) and degummed and neutralized palm olein (dgnPOo) were used (*Figure 1*). The characteristics of the oils are shown in *Table 1*. Comparison was made with fully processed palm olein, that is refined,



Figure 5. Some of the Panelists Evaluating the Product

Results of sensory evaluation indicated that satay sauce made with CPOo received the highest score for colour (Figure 6). It had a more attractive red colour, than satay sauce made with RBD POo (Figure 4). Satay sauce made with nPOo received the second highest score for colour followed by that made with dgnPOo. On the other hand, satay sauce made with RBD POo received the highest scores for odour, taste and overall acceptability (Figure 6). Satay sauce made with nPOo and dgnPOo received better scores than the product made with CPOo in terms of odour, taste and overall acceptability. In spite of the lower scores it received in terms of odour, taste and overall

acceptability, the product made with CPOo was still acceptable.

Quality of the final product depends to a large extent on the quality of the raw materials used. It was thought that freshly prepared unrefined or crude palm oil (CPO) would give a better tasting satay sauce. Thus palm oil was extracted in the laboratory using the following steps: Palm fruits were sterilized in a mini sterilizer at 130°C and pressure of 1.8 psi for 2 hr. After sterilization, the kernels were manually separated from the mesocarp. The oil was extracted from the mesocarp with a hydraulic press to yield a crude red palm oil. The oil, freshly prepared, was used in making the satay sauce. The product made was subjected to sensory evaluation. Since home-made and commercial satay sauce is often made with RBD POo, comparison was made against satay sauce made with RBD POo and also a commercial sample.

In sensory testing, the samples were coded by 3-digit random numbers to avoid any bias judgement. Figure 7 shows that satay sauce made with fresh CPO prepared in the laboratory received the highest scores for colour, odour and overall acceptability, while its score for taste was very close to that of satay sauce made with RBD POo.

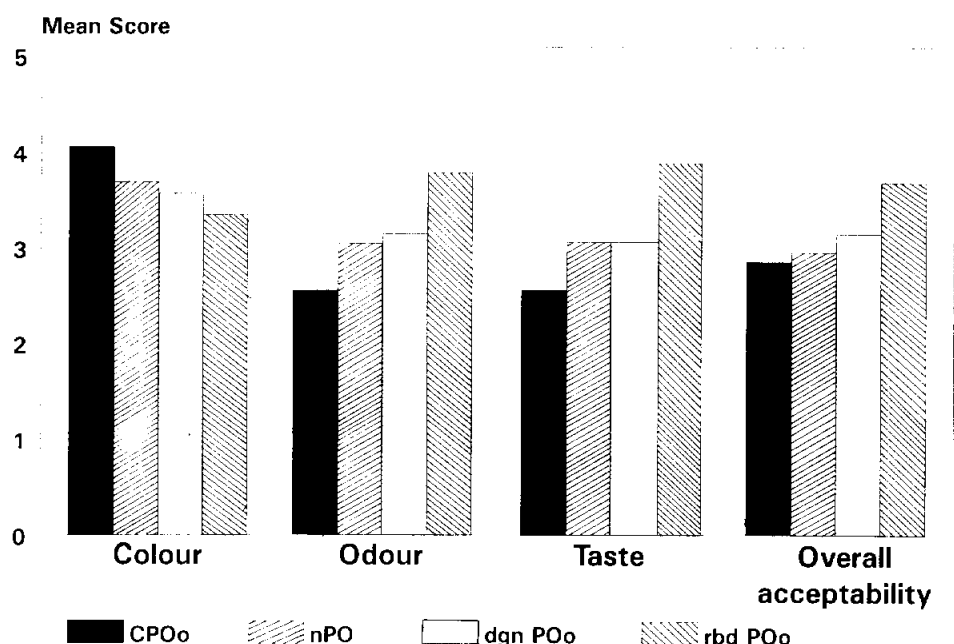


Figure 6. Mean Score for Colour, Odour, Taste and Overall Acceptability of Satay Sauce Made with Crude Palm olein (CPOo), Neutralized Palm olein (nPOo), Degummed and Neutralized Palm olein (dgn POo) and Refined, Bleached and Deodorized Palm olein (RBD POo)

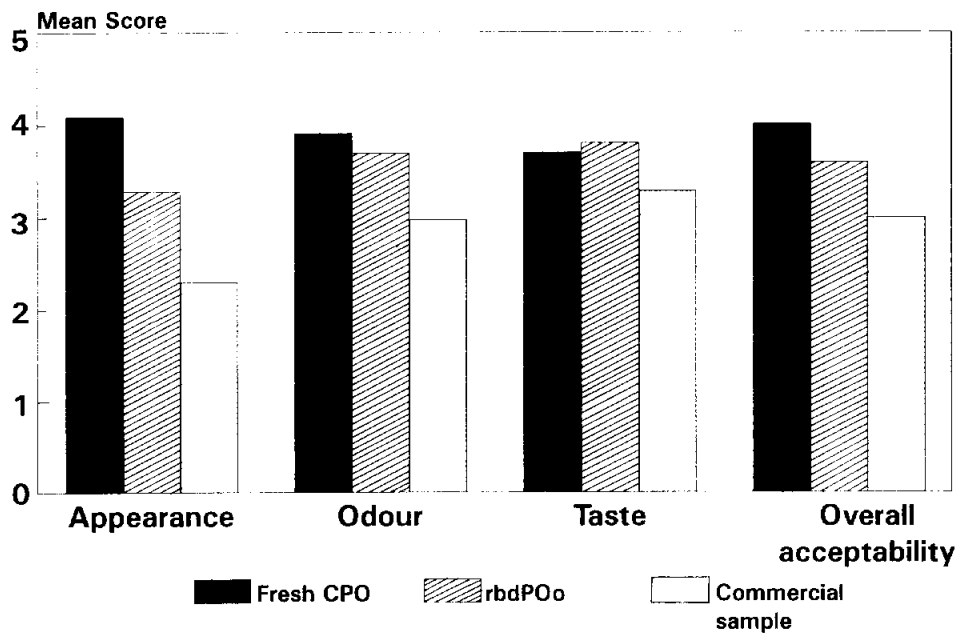


Figure 7. Mean Score for Colour, Odour, Taste and Overall Acceptability of Satay Sauce Made with Fresh and Laboratory Prepared Crude Palm Oil (CPO), Refined, Bleached and Deodorized Palm olein (RBD POo) and Commercial Sample of Satay Sauce

Satay sauce made in PORIM’s experimental kitchen obviously received higher ratings than the commercial sample. The commercial sample did not have an attractive appearance due to its dull colour thus it received a rather low score for this attribute. Figure 8 shows satay sauce made with the fresh CPO prepared in the laboratory.



Figure 8. Satay Sauce Made with Fresh CPO Prepared in the Laboratory

CONCLUSIONS

Satay sauce with a very attractive colour and of

desirable odour and taste can be made with high quality palm oil rich in carotene. The product was found to be very acceptable by the panel of judges. Indeed, such an oil is a good source to combat vitamin A deficiency which is prevalent in many Asian countries. Findings from this study would help promote the use of carotene rich palm oil/olein in cooking.

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