

PRODUCTION AND CHARACTERIZATION OF PALM-OIL-BASED SANTAN POWDER

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INTRODUCTION

Coconut milk (santan) is a commonly used ingredient in the preparation of food, both at home and industrially in Malaysia. A large proportion of the population still use 'santan' extracted from freshly grated coconut for their cooking requirements. However, the trend now is towards a more convenient form for obtaining the product. Currently self-stable forms of santan are readily available locally in various forms. One of them is a powdered 'santan' powder which is easy to handle during storage and transportation. 'Santan' from palm oil in powder form has been produced as a substitute for coconut santan powder using spray drying technique. Its nutrient composition is similar to that of commercial santan in terms of fat (60.5%), protein (7.35%), moisture (1.82%), ash (0.65%) and carbohydrate (29.7%) respectively.

ADVANTAGES OF USING PALM-BASED SANTAN POWDER

Palm oil has good nutritive value comparable to other vegetable oils because of its fatty acid composition and minor constituents. In the animal model, palm oil diet does not raise blood cholesterol levels, and it inhibits arterial thrombosis and atherosclerosis and increase coronary blood flow. These beneficial properties of palm oil in terms of a reduction of risk of coronary heart disease may be related to the minor constituents in palm oil. It is believed that the large amount of saturated fatty acids (C_{12} - C_{14}) in coconut oil is a major dietary cause of hypercholesterolemia if used continuously in food products. Palm-based 'santan' powder produced through spray drying technique is formulated in such a way to reduce deterioration, (e.g. oxygen, light, moisture), improve flavour and nutritive value, enhance stability and handling during storage and transportation. Spray drying technique is also economical in producing the palm-based 'santan' powder.

MATERIAL AND METHODS

Spray drying is a highly practical preparation technique. The feed material is an emulsion in which the disperse phase to be encapsulated in the palm oil and the continuous phase will be material solution made up of wall material and emulsifiers for stabilization of the emulsions. Emulsifiers are added for stabilization of the emulsions. To enhance the flavour and aroma of palm-based santan powder, artificial coconut flavour was incorporated into the formulation. The water was evaporated and the polymer forms a dry matrix in which the core material was embedded. Anti-caking agent was added to prevent waxy surface formation and improve the powder flow ability. The whole preparation process is shown in Figure 1 and Figure 2.

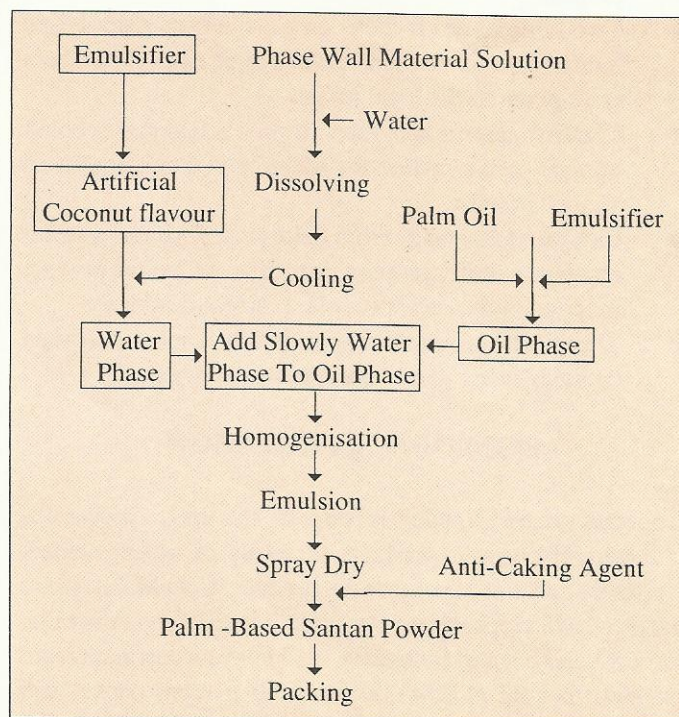


Figure 1. Flow Diagram of Palm-Based Santan Powder by Spray-Drying Technique

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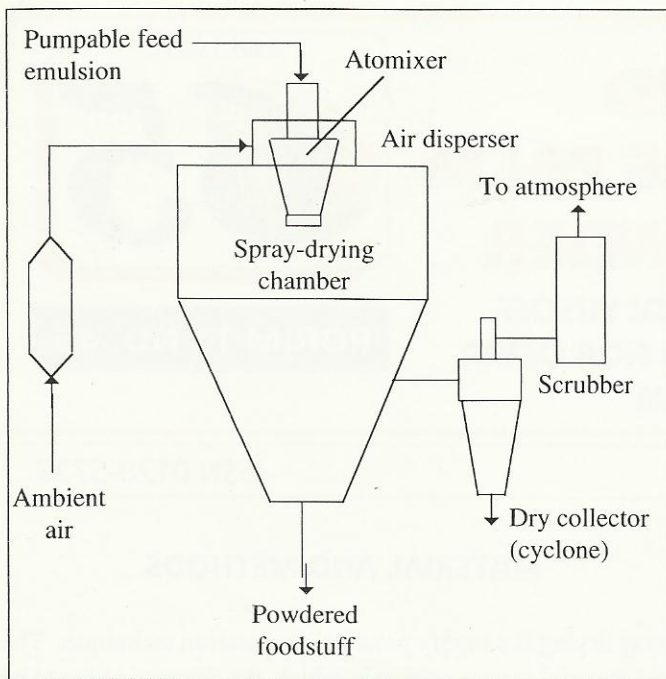


Figure 2. Co-Current Flow Spray Dryer

SENSORY EVALUATION OF PALM OIL - BASED SANTAN POWDER USED ON A FOOD PRODUCT

- Sensory evaluation of palm-based 'santan' powder sample in a curry was conducted using a local panel of judges.
- Two samples of chicken curry made from palm-based 'santan' powder coded with three digit random numbers were given to the local judges.
- The first sample was made from commercial coconut 'santan' powder while the other one from palm-based 'santan' powder.
- Chicken curry made from palm-based 'santan' powder received a score comparable to the commercial product in terms of appearance, colour, aroma and taste.
- The results indicate that good quality chicken curry can be made using palm based 'santan' powder.

ECONOMIC EVALUATION

Coconut cream powder is one of the most successful commercial coconut products in terms of value added. Currently coconut cream powder products from Malaysia are exported to Europe, North America, Middle East, Australia, Far East and even to Indonesia. In Malaysia coconut cream powder is sold at RM1.00 for a 60 g retail packet and RM9.00/kg for commercial uses in packaging of 25 kg. The industry is facing a decreasing supply of coconut and most of the coconut cream powder factories are running at less than 50% of their capacity. Coconut hectareage is stagnating if not declining in Malaysia, and in other coconut producing countries too.

Compared to coconut cream powder production, "palm-based formulated santan powder" should have a brighter future from the supply point of view, given the same if not better technology, product quality, consumer acceptance and competitive price. Since palm oil production is on the rise, supply of raw material should not be a limitation. The most important equipment required in a production facility would be the spray dryer, the commercially available range from 60 kg/hr to 2000 kg/hr output. A respectable 500 kg/hr "palm oil based formulated santan powder" factory requires an investment of more than RM10 million, the spray dryer being the most expensive. Thus, this is not suitable for small and medium industries.

On the basis of all the positive attributes there is no reason why "palm-based formulated santan powder" could not be a successful venture, given the product development, promotion, quality improvement, consumer acceptance and price competitiveness.

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