

DRYING PROCESS OF MICROENCAPSULATED RED PALM OIL



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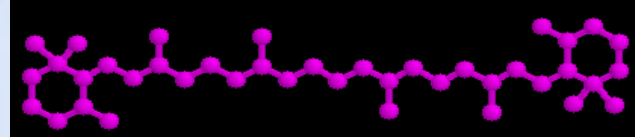
**BOGOR AGRICULTURAL UNIVERSITY
INDONESIA**

INTRODUCTION



500 ppm

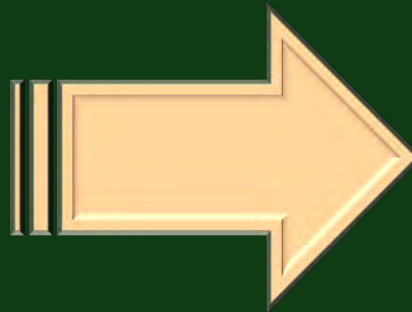
Palm oil:
potential
source of
carotenes
(mainly β -
carotene)



Utilization of palm oil
carotene as food
ingredient and food
supplement



Crude palm oil (CPO)



Red palm oil (RPO)

High
carotene
content of
RPO: ± 250
ppm



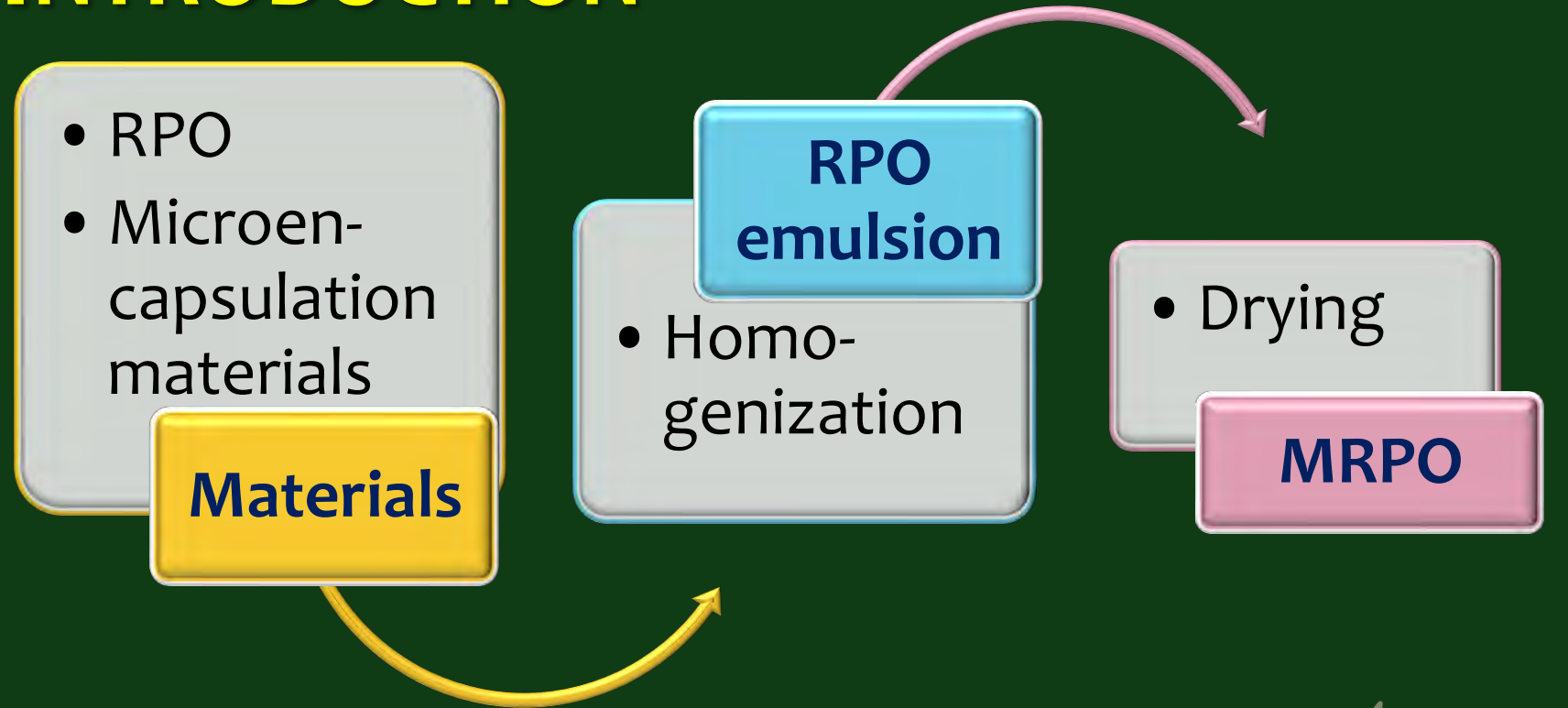
Sensitivity of
carotene to O₂,
light, heat

Protection
by microen-
capsulation
process



**Microen-
capsulated
RPO**

INTRODUCTION



Boundary conditions:

- High viscosity of RPO
- Susceptibility of β -caroten to high T

**Suitable
dryer**

OBJECTIVES

1

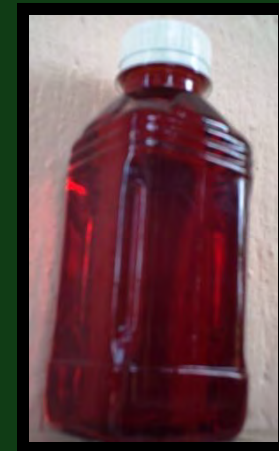
- to determine the most suitable drying equipment for producing MRPO

2

- to study the drying parameters of the chosen drying equipment

METHODS

- RPO was produced in pilot plant scale of oil line production at SEAFAST Center.



METHODS

Material formulation



Emulsification



Drying of the emulsion



Mikroencapsulated RPO






METHODS

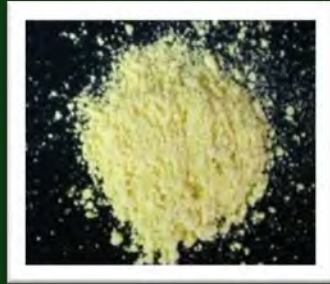
- The drying experiments were conducted by using tray dryer, drum dryer, and spray dryer
- The drying time and drying process performance were evaluated, and quality attributes of MRPO were measured.



RESULTS: DRYING PERFORMANCE

Parameter	Spray Dryer T_{in} 150°C, T_{out} 70°C	Drum Dryer 3 rpm, T 95,5°C	Tray Dryer T 50 °C
			
M.C. (% d.b.)	3,94	4,85	6,01
Carotene content (ppm)	160	78	230
Carotene Retention (%)	55,70	31,52	74.76%
Solubility (%)	88,6	86,64	90.71
Colour (+b)	25,07	23,63	27,98
Drying system	Kontinyu	Kontinyu	Batch (8 h/batch)
Drying rate (g emulsion/hour)	0,5 kg/h	0,6 kg/h	0,24 kg/h

MICROENCAPSULATED RED PALM OIL



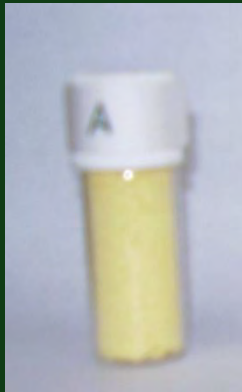
Spray dryer



Drum dryer



Tray dryer



RESULTS



- The position of the tray and the thickness of the RPO emulsion layer affected the drying time, moisture content, and drying rate
- The thickness of emulsion layer will determined drying time and drying rate to achieve the same moisture content
- The recomended emulsion layer thickness with good drying process parameters for tray dryer was 1.5 mm



CONCLUSIONS

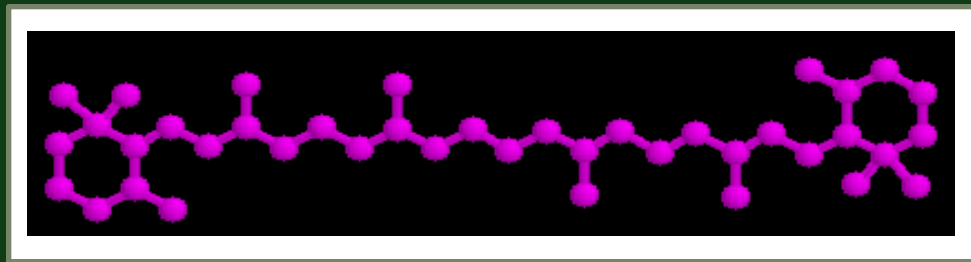
- Tray dryer can be used for producing high quality of MRPO, regarding of β -carotene contents and recovery during drying process.
- The process efficiency of tray dryer must be improved by using continuous drying system



ACKNOWLEDGEMENT

- RUSNAS Project from Ministry of Research and Technology, Republic of Indonesia
- Southeast Asian Food and Agricultural Science and Technology Center – Bogor Agricultural University





THANK YOU

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