



**GOVERNMENT OF TAMILNADU  
DIRECTORATE OF TECHNICAL EDUCATION, CHENNAI**

**STATE PROJECT COORDINATION UNIT  
(Established under Canada India Institutional Cooperation Project)**

**CURRICULUM**

Course Name	<b>Production of Ben Oil</b>
Course Code	CHE/2020/001
Course Duration	60 Hours
Minimum Eligibility Criteria and Pre-requisites(if any)	10th Std & above
Course Objectives	<p>Training module has been designed</p> <ul style="list-style-type: none"> <li>To provide Better Knowledge of Production and Quality</li> <li>To Minimize Human Errors in production of oil - Greater Accuracy and Consistency</li> <li>To improve Reliability , Efficiency and consistency of production of oil</li> <li>To Reduce the Cost of Production</li> <li>To keep Good Working Environment</li> </ul>
Course Outcomes	<p>At the end of training, the participants will be able to learn</p> <ul style="list-style-type: none"> <li>The better quality of Ben Oil Production</li> <li>Production of Ben oil in a greater accuracy and consistency due to reduced errors</li> <li>Increased efficiency by following the SOP</li> <li>Multiple roles like financial accountant, cost accountant, audit assistant, etc.</li> <li>Reduction in Production costs via., optimizing the Breakeven Point in Process condition and Energy utilization</li> <li>Lower operating costs due to reduced need for human resources and stationery</li> <li>Better knowledge of production and process safety</li> </ul>
Expected Job Roles	Process Technician, Production Supervisor and Production Manager

<b>TEACHING AND SCHEME OF EXAMINATION</b>					
Course Code	Course Name	Hours	Assessment Marks		Duration of Examination
			Min	Max	
CHE/2020/001	Production of Ben Oil	Theory	20	10	3 Hours
		Practical	40	40	
		Total	60	50	

**CHE/2020/001- PRODUCTION OF BEN OIL**DETAILED SYLLABUS

Unit No.	Modules	No. of Hours	
		Theory	Practical
I	Introduction	16 Hours	
1.1	Introduction to Production of Ben Oil	6	10
1.2	Raw material - Identification, Properties of Muringa oleifera seed		
1.3	Types of Process -Extraction, cold pressing techniques and other novel techniques, suitable solvent and process parameters		
II	Raw Materials Purification steps	17Hours	
2.1	Qualify control of Seeds – Seed size, shape and moisture content	7	10
2.2	Purification Steps – Deskinning, Washing with running water, Powdering and screening		
2.3	Solvent – Selection of solvents and solvent purity		
III	Ben Oil Production and Packaging	27 Hours	
3.1	Selection of Process	7	20
3.2	Characteristics, uses and benefits of ben oil		
3.3	Ben oil packaging and Marketing dynamics		
Total Theory and Practical Hours		20	40
Total Hours		60	

## HARDWARE REQUIREMENT

S.NO	LIST OF TOOLS /EQUIPMENTS
1.	Solvent Extracter
2.	Deskinner
3.	Magnetic Stirrer
4.	Heating Mandle
5.	Burrete
6.	Measuring Jar

## REFERENCE WEBSITE / BOOKS

1. Burkill, J. H. 1966. A Dictionary of Economic Products of the Malay Peninsula. Art Printing Works, Kuala Lumpur. 2 vols.
2. Duke, James A. 1983. Handbook of Energy Crops, *Moringa oleifera* Charles Knight. 1833. The Library of Entertaining Knowledge; Vegetable Substances: materials of manufactures. 22, Ludgate Street, and 13, Pall-Mall East, London.
3. Leone A., Spada A., Battezzati A., Schiraldi A., Aristil J., Bertoli S. Cultivation, genetic, ethnopharmacology, phytochemistry and pharmacology of *Moringa oleifera* leaves: An overview. Int. J. Mol. Sci. 2015;16:12791–12835. doi: 10.3390/ijms160612791. [PMC free article] [PubMed] [CrossRef] [Google Scholar]
4. 2. Leone A., Fiorillo G., Criscuoli F., Ravasenghi S., Santagostini L., Fico G., Spadafranca A., Battezzati A., Schiraldi A., Pozzi F., et al. Nutritional characterization and phenolic profiling of *Moringa oleifera* leaves grown in chad, sahwari refugee camps, and haiti. Int. J. Mol. Sci. 2015;16:18923–18937. doi: 10.3390/ijms160818923. [PMC free article] [PubMed] [CrossRef] [Google Scholar]
5. 3. Anwar F., Ashraf M., Bhangar M.I. Interprovenance variation in the composition of *Moringa oleifera* oilseeds from pakistan. J. Am. Oil Chem. Soc. 2005;82:45–51. doi: 10.1007/s11746-005-1041-1. [CrossRef] [Google Scholar]

## ASSESSMENT AND CERTIFICATION

S.No	Criteria for assessment
1.	A trainee will be assessed based on the performance in End Examination for Theory and Practical conducted internally in the Project Polytechnic College for a duration of 3 hours
2.	A trainee must have 75% of attendance to appear for End examination in Theory and Practical.
3.	The assessment for theory part will be based on the marks scored in the end examination on the knowledge bank of questions (1 word/objective type questions)
4.	The assessment for practical part will be based on the marks scored in the end examination conducted by the Project Polytechnic and assessed by the Examiners approved by Strategic Plan Implementation Committee (SPIC) of the project polytechnic.
5.	The criteria for successful completion of training is every trainee should score 50% of marks in theory and practical examination.
6.	On successful completion of training , Certificate will be issued to the participants by the Directorate of Technical Education through the Project Polytechnic.

### END EXAMINATION ALLOCATION OF MARKS

S.No	Description	Max.Marks
1.	Theory Examination	20
2.	Practical Examination	
	a)Aim	5
	b)Procedure	15
	c)Observation /Calculation	15
	d)Experiment handling	15
	e)Result	10
	f)Record	20
<b>Total Marks</b>		<b>100</b>

**THEORY MODEL QUESTION PAPER**  
**CHE/2020/001 – PRODUCTION OF BEN OIL**

(Maximum Marks: 20)

(N.B: Answer any **Twenty** questions)

**20x1= 20 Marks**

1. What is Ben oil?
2. Why ben oil is important in food?
3. Write the raw material used in production of ben oil
4. How to identify the quality of seed?
5. Write down the types of ben oil production
6. What is extraction?
7. Which solvent is used to extract the ben oil from murunga?
8. How to find the quality seed?
9. How to identify the quality of solvent.
10. What is cold press technique?
11. Which process is very economic to produce the Ben oil?
12. What are the parameters to be maintained in the production of ben oil?
13. Note down the purification steps involved in seed preparation.
14. What are the uses of ben oil?
15. Write down the any two types of packing material for ben oil
16. Write any two comparison of ben oil with conventional oil
17. Is this ben oil production may easily be home made.
18. Write any two equipments used in production of ben oil.
19. Name any two solvent involved in ben oil production
20. Name any two Process involved in extraction of ben oil.
21. Write any two methods of cultivation of murunga seed.
22. How to identify the quality of murunga seed.
23. Write any two methods of drying of seeds.
24. Write any two chemical properties of ben oil.
25. What is the boiling point of ben oil?