

Information of the research projects undertaken in the area of Jaggery Post Harvest Technology at Kolhapur centre.

1. Name of the institution : All India Coordinated Research Project on Post Harvest Technology, Regional Sugarcane & Jaggery Research Station, Kolhapur.

2. Brief mandate : i) Study of the prevalent processes and equipment in different parts of the Country for jaggery and khandasari
ii) Development and standardization of processes assuring quality products
iii) Adoption and development of bullock and power operated sugarcane crushers for higher juice extraction
iv) Design and development of efficient processing and packaging equipment
v) Improvement of furnaces and manufacturing gadgets for fuel economy and reduced drudgery
vi) Development of packages, covers, containers and structures for short term and long term storage of jaggery and khandasari with minimum qualitative and quantitative losses at home, farm (processor and distributor levels) both for domestic consumption and export markets.
vii) Field evaluation and transfer of laboratory proven technologies

3. Broad areas of research :
Pre and Post harvest technologies of Jaggery and their by-products.

4. list of the successfully completed or underway projects related to Food Processing, Post Harvest Technology, Packaging, New Product Development, Supply Chain or Allied Fields.

Sr. No.	Title of the Research project	Brief Description (Around 50 words)	Year of Project	Contact details of the Head of the Project
Completed research projects				
1.	Standardization of mechanical method of settling of liquid jaggery	<p>Objectives:</p> <p>i) To study the effect of different speed and duration of centrifuge machine for settling of liquid jaggery.</p> <p>ii) To study the effect of mechanical settling on keeping quality of liquid jaggery.</p> <p>Experimental details :</p> <p>a) Natural settling - Settling of liquid jaggery for 9 days (control)</p> <p>b) Mechanical settling - i) Speed of centrifuge machine 6000 rpm, 7000rpm, 8000 rpm.</p> <p>ii) Duration of centrifugation 3 min, 4 min, 5 min.</p> <p>Research centrifuge machine- (Make- Remi)-8 tube, vol. 100 ml each.</p> <p>Recommendation :</p> <p>To maintain the quality of liquid jaggery during storage, processing of liquid jaggery by centrifuge machine @ 7000 rpm for 5 minutes period is recommended.</p>	2006-07	Dr. B. G. Gaikawad, Senior Research Officer, AICRP on PHT, RSJRS, Kolhapur.
2.	Effect of size and packaging on storability of jaggery powder.	<p>Objectives :</p> <p>i) To study the effect of powder size and packaging on storability</p> <p>ii) To assess the quality of stored jaggery powder</p> <p>Experimental details :</p> <p>Preparation of solid jaggery in the Pilot plant at RS&JRS,</p>	2006-07	

		<p>Kolhapur. Drying of coarse pieces of jaggery collected from jaggery cooling pit at 45⁰ C and 5 hrs in tray dryer. Then size reduction by hammer mill and sieving of jaggery powder.</p> <p>A) Jaggery powder size grade 1mm, 2mm, 3mm</p> <p>B) Packaging material i) Polythene - 100, 200 , 300 gauge ii) Plastic jar (200 g capacity) iii) Three ply laminate (Poly/ Al. foil/ Pet)</p> <p>Storage of jaggery powder at room temperature.</p> <p>Recommendation : For better storage of jaggery powder, packing of coarse size (3mm) jaggery powder in 300 gauge thick polythene bag is recommended.</p>		
Underway research projects				
1.	Development of organic jaggery production process	<p>Objectives :</p> <p>i) To study the effect of organic base acid clarificant for adjusting pH of sugarcane juice</p> <p>ii) To study the quality of jaggery produced by organic method</p> <p>Treatment details :</p> <p>A) Organic jaggery production with organic acid clarificant (Bhendi mucilage + Lime + Citric acid)Application of citric acid (g / 1000 lit.) i) 100 ii) 150 iii) 200</p> <p>B) Farmers practice of organic jaggery production- (I) (Bhendi mucilage + Lime)</p> <p>C)Farmers practice of organic jaggery production-(II)(Bhendi mucilage)</p> <p>D) Recommended method of jaggery production (Bhendi mucilage + Lime + Phosphoric acid) –Control</p> <p>For all the treatments sugarcane cultivated by organic method will be used.</p> <p>Results : The jaggery samples prepared organically by using citric acid showed keeping quality superior than the keeping quality of jaggery prepared by recommended method of jaggery production.</p>	2007-08	

2.	Development and performance testing of scum filter for improving the quality of jaggery.	<p>Objectives :</p> <ol style="list-style-type: none"> 1) To develop the scum filter and to test its Performance for on line utilization of clarified juice in jaggery processing. 2) To assess the effect of scum filtered juice on the quality of jaggery <p>Treatment details :</p> <ol style="list-style-type: none"> 1) Farmers practice – scum tank 2) Scum filter – Farmers practice Filter of dried bagasse and gunny bag 3) Scum filter- Double layer filter <ol style="list-style-type: none"> a. Nylon net - Cotton cloth b. Nylon net -Steel sieve 500μ <p>Results :</p> <p>Double layer (Nylon net + G I sieve) scum filter was found efficient in separation of scum from clarified sugarcane juice during jaggery processing.</p>	2009-10					
3.	Effect of anticaking agent on the free flowing nature of jaggery powder	<p>Objectives :</p> <ol style="list-style-type: none"> 1) To study the effect of anticaking agent on the free flowing nature of jaggery powder during storage 2) To study the effect of anticaking agent on quality of jaggery powder <p>Treatment details :</p> <p>Powder jaggery will be prepared manually and dried in shade. The anticaking agents will be mixed in powder as per treatments. Jaggery powder will be sieved into three sizes and packed into 300 gauge polythene bag.</p> <p>Powder size (mm) 1 mm, 2 mm, 3 mm</p> <p>Anticaking agent (Permitted as per Prevention Food Adulteration Act -1954)</p> <table border="0"> <tr> <td>1. Calcium carbonate</td> <td>2. Silicon dioxide</td> </tr> <tr> <td>3. Sodium silicate</td> <td>4. Maltodextrin</td> </tr> </table> <p>Application rate (%) 0.25 0.50 1.00</p> <p>Results : Based on the results of jaggery powder storage it was concluded that</p> <ol style="list-style-type: none"> 1. The anticaking agent Maltodextrin was found to be superior in respect of lowest moisture content (2.22 %) and higher NRS (78.47 %). 2. The application of anticaking agent @ 1.00 % was found superior in respect of lowest moisture content of jaggery powder (2.50 %). 	1. Calcium carbonate	2. Silicon dioxide	3. Sodium silicate	4. Maltodextrin	2009-10	
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		3. Jaggery powder coarse size was found superior in respect of lowest RS (7.78 %) moisture content (2.54 %) of jaggery powder.		
4.	Effect of advanced packaging techniques on storability of jaggery	<p>Objectives:-</p> <p>1) To study the effect of advanced packaging techniques viz., vacuum packaging, nitrogen packaging and shrink wrapping on quality of jaggery during storage.</p> <p>2) To identify suitable packaging technique for storage of jaggery.</p> <p>Treatment details:-</p> <p>A) Packaging technique</p> <p>i) Vacuum packaging ii) Nitrogen packaging</p> <p>iii) Shrink wrapping iv) Heat seal machine</p> <p>B) Packaging material</p> <p>i) LDPE ii) Laminated polythene</p> <p>Experiment is in progress.</p>	2010-11	