ACHIEVEMENTS – XII PLAN

(April 2012 to March 2017)

AICRP on POST HARVEST ENGINEERING AND TECHNOLOGY (ICAR), JUNAGADH CENTRE

(1) TITLE: Establishment of Agro Processing Centre

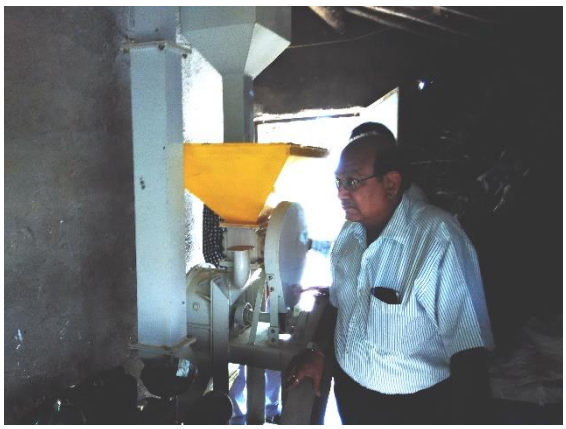
At Tadka Pipaliya Ta. Bhesan Dist. Junagadh Agro Processing Centre was established in 2003. It was strengthen with new processing machineries like pulse mill, spice mill etc.

Three new Agro Processing Centres were established by Junagadh Centre viz. Loej, Virol and Chotila. Even one more Agro Processing Centre was established at Vadala under TSP project.

Viro Agro Processing Centre

Loej Agro Processing Centre

Chotila Agro Processing Centre



Vadala Agro Processing Centre

Process Technology Developed:

(1) Integrated Pest Management in Coriander

In the storage technology of coriander the minimum pest population and minimum percent grain damage was found in the treatment of aluminum phosphide + microwave + plastic coated jute bag and it was at par with the

treatment aluminum + plastic coated jute bag, microwave + plastic coated jute bag and only plastic coated jute bag storge of coriander.

Looking to the economics of different storage treatment the highest ICBR(1:13.60) was obtained in the treatment of plastic coated jute bag(c), followed by treatment of aluminum phosphide plus plastic coated jute bag (1:12.46) as compared to traditional method(Gunny bag)

(2) Extraction of different enzymes from the potato peel substrate by using the *Bacillus* group of Bacteria.

The process technology for production of enzyme from potato peel substrate was carried out. The standard bacterial culture was purchased from the Microbial Type Culture Collection Centre (MTCC), Chandigarh. Research was carried out using bacterial culture available from MTCC, Chandigadh.Consumption of starch from potato peel substrate for amylase production was carried out. Amylase activity was found during research work. It was obtained 59.49 mg/g per 10 gram of potato peel.The activity of protease enzyme is also obtained. It was 4.47 mg/g per 10 gram of potato peel.

(3) Process development for extraction of pectin from Mango peel using cation exchange resin..

Standardization of extraction condition for pectin extracted by cation exchange resin

The yield and quality of pectin extracted from mango peels at 80 and 100 ^{0}C with an extraction ratio 1 : 2, 1 : 3 and 1 : 4 by cation exchange resin as discussed in above sections. From above discussion it is clearly noted that, yield and quality of pectin was found better when extracted at 80 ^{0}C with an extraction ratio 1 : 4.

Based on the above study the following extraction conditions are suggested for mango peel pectin extracted by cation exchange resin as given in the Table 1, whereas the quality parameters of pectin extracted by standardized extraction condition are presented in Table 2.

Table 1. Standardized extraction conditions for mango peel pectin by cation exchange resin

Particulars	Extraction Condition
Extracting medium	Cation exchange resin
Raw material	mango peels
Extraction ratio	1 : 4
Extraction pH	2.56
Extraction temperature	80 ± 2 ^{0}C

Extraction time	60 min.
Number of extraction	2

Table 2 : Quality of mango peel pectin extracted according to standardized extraction condition for cation exchange resin

Particulars	Pectin Quality
Yield of pectin (%DWB)	14.78 %
Recovery of pectin	96.32 %
Ash content	1.2180 %
Alkalinity of ash	9.8525 %
Equivalent weight	857.20
Methoxyl content	3.91 %
Relative viscosity	13.9722
Jelly grade	269
Recovery of cation exchange resin	96.03 %

(4) Storage study of mechanically damage wheat by combine harvester

During the mechanically harvested wheat by combine harvester, there is damage of wheat grain consequently it becomes difficult for storage. The storage technology for wheat was developed. It is concluded that the mechanically damage (0-9%) wheat harvested by combine harvester could be stored with the treatment of castor oil (15ml/1.0Kg seed) and kept in metal bin container remain safe up to eight month of storage. While in case of 3 % damage it could also be stored with castor oil (15ml/1.0Kg seed) and kept in plastic bag with minimum loss. Whereas for no (0%) damage wheat grain could be stored with castor oil (10ml/1.0Kg seed) and kept in metal bin or it could also be stored with castor oil (15ml/1.0Kg seed) and kept in plastic bag with minimum loss.

(5) Preparation of extruded products from flour of amaranth grain, sago and defatted groundnut.

To prepare quality cold extruded Farali (snake) products (pasta) from blending defatted groundnut flour, amaranth flour and sago flour (as a binder) in the ratio of 20, 70 and 10 % respectively followed by sun drying for 14 hrs in summer months or in cabinet dryer for 1hr at 55 ^{0}C. The product can be stored in polyethylene (LDPE) bags of 75 micron to retain the good quality up to three months of storage period.

(6) **Assessment of microbial floral strength during post harvest handling of custard apple & lemon.**

The microbial floral strength of custard apple and lemon was assessed during various post harvest handling viz., harvesting, collection, grading, packaging, at the level of whole seller, at the level of retailor. It is recommended that amongst all stages between a field to consumer, the presence of harmful fungus and bacteria during transportation was observed maximum and increasing in the subsequent stages. Therefore, control measures to check fungal and bacterial growth prior to transportation is necessary.

Machines developed

(1) Design and development of manual operated sapota cleaner.

The manual operated sapota cleaner was designed and developed. The jute cloth coated inside the cleaner gives best performance for cleaning of 25-30 kg sapota to clean upto 95-97 % with maximum 2% damage to fruit quantity. The capacity of machine is 270 kg/hr and cost of saving for cleaning of sapota is Rs. 0.29/kg as compared to manual cleaning i. e. 58% saving of cost of cleaning. This is a hand operated batch type sapota and evaluated at the farm level. The cost of machine is Rs. 5000/-

(2) Design and development of power operated sapota cleaner.

Continuous type electrical motor operated sapota cleaner was developed. It is optimized at 35 rpm rotating speed of drum with 2 degree angle of drum. This can be operated by two operators with 550 kg/hr capacity with 100% cleaning efficiency and without damage of sapota. The cost of machine is Rs. 18000/-.

Other research project carried out by Junagadh Centre are

1. Survey to identify the practices for ripening of fruits
2. The MoFPI sponsored project on “Assessment of Harvest and Post Harvest Losses of major crops and commodities in India”
3. FCI sponsored project on Study on Determining Storage Losses of Food Grains in FCI and CWC Warehouses

Technology and Demonstration mela were organized at Junagadh Centre in the year 2015, 2016 and 2017.