

NEWS BULLETIN

UPDATE ON FRUIT AND VEGETABLE PROCESSING CLUSTER, PUNE

Dear Readers,

The Pune Processed Fruit & Vegetable Cluster Programme has come a long way and has completed more than 1 - ½ years since its inception in August 2007. Among the initiatives spanning ongoing focus on technology & export development in the cluster, existing tie up arrangements with National Level Institutes like CFTRI Mysore and IIFT, New Delhi have led to two more training programmes during Feb. - March 2010.

The 3 day on-campus training programme on "Modified Atmosphere Packaging for Fresh, Cut and Processed Vegetables and Dehydration of Fruits and Vegetables" at Mysore saw 12 BDS & firm participants from the cluster attend training on state of the technology which is now globally being exploited. It was important for Pune cluster to be abreast of this key technology to remain globally competitive. NAFARI was the nodal agency setting the tone for this training. Another important workshop conducted in association with MCCIA was on "Export marketing for Processed Fruits & Vegetables and Other Food products". Issues deliberated in the workshop were Present & Future Opportunities, Innovations in Processed Food Export markets, SPS Standards, Export market Research & Entry, International Trade Procedures, HACCP and ISO 22000.

We shall strive to leverage our relationship with key institutes like CFTRI & IIFT during FY 2010-11 also. An on-campus BDS development 3- day training on export market development with IIFT could be in the offing next quarter while technology transfers and a few trainings on quality & technology, quality issues will be taken up with CFTRI type institutes.

A Mobile Van was launched in February 2010 for catering to the testing & training requirements of remote & rural firms through MAARC labs. Buyer seller Meet was organized in association with Media Cura Infoline. This will enable forge business direct supply linkages between Raw material suppliers and Processing firms reducing the cost escalation due to multi layered cost supply chain. Technologists will be involved in training the bulk suppliers for matching the industry's quality & hygiene requirements. Foray into Automation was continued with Association of Food Scientists and Technologists Pune Chapter organising a seminar with the objective of establishing business linkages. A report on financial products required in the cluster was yet another important initiative launched with the project support.

However, the hall mark of the quarter was a series of 4 month Post Graduate Certificate Course started by NAFARI with Project support. NAFARI's status as a quality and technology trainer has grown by leaps and bounds over the last two years and this course is going to be a big landmark in its journey towards much needed industry demanded training courses in the cluster.

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IMPORTANT ACTIVITIES CONDUCTED DURING FEB – MAR 2010

1. Fifth CCC meeting: Cluster Co-ordination committee meeting was held on 2nd Feb, 2010 at Nafari to take a review of the activities conducted in the last quarter and invite suggestions for the next financial year's Annual Plan. Mr. Oswal, NAFARI, briefed about the PGCC course commenced by NAFARI from 12th Jan 2010. Dr. Naikare, AFSTI, explained about the study tour to automation industries for the preparation of Auto seminar which was planned in February end. Dr. Mrs Vasudha Keskar, MAARC LABS gave a presentation on Mobile testing laboratory.

2. Buyer Seller Meet for Strawberry Growers and F&V Processing Industries: Buyer seller Meet was organized in association with Media Cura Infoline on 20th Feb, 2010 at Aacharya Atre Sabhagruha, Pune. The main aim of the event was to organize one – to – one meetings between Raw material suppliers (growers) and processing firms as well as technologists, to create useful linkages. More than 30 people participated in the event.

3. Seminar on "Automation in Food Industry": Seminar on Automation in food industry was organized in association with Association of Food Scientists and Technologists (India)(Pune Chapter) on 25th Feb, 2010 at premises of SNDT college, Pune. The main aim of the seminar was to create Business Linkages of Automation consultants and F&V Processing Industries. The lectures covered several topics ranging from Advances in machinery for fruits and vegetables processing Need of mechanization on post harvest operations in fruits and vegetables industry, Machinery for packaging used for fruits and vegetables processing industry, Equipments for

small scale operations in F & V processing industry to Machinery for small scale processing, etc. There was a mass participation with more than 75 people.

4. Training Program on "Modified Atmosphere Packaging for Fresh, Cut and Processed Vegetables and Dehydration of Fruits and Vegetables": National Agriculture and Food Analysis and Research Institute (NAFARI) & ACDS in association with Central Food Technological Research Institute (CFTRI), Mysore had organized a training on "Modified Atmospheric Packaging for Fresh, Cut and Processed Vegetables and Dehydration of Fruits and Vegetables" from 3rd to 5th March 2010, at CFTRI, Mysore.

5. Workshop on Export marketing for Processed Fruits & Vegetables and Other Food products: ACDS in association with MCCIA conducted workshop on Export marketing for Processed Fruits & Vegetables and Other Food products on 20th Mar, 2010. The basic objective of the seminar was to provide training of firms on export market nuances in various global regions. Five lectures were conducted on the topics 1) Present Status & Future Opportunities in Processed Food Export and related SPS Standards, 2) Export market Research & Export market Entry, 3) Getting Ready for Exports & International Trade Procedures, 4) Opportunities for Innovation in Processed Fruits & Vegetable products for Exports, 5) Introduction to HACCP and ISO 22000. The speakers answered the queries of the participants. Around 55 participants from Pune F&V processing Cluster attended the seminar.

EDITORIAL TEAM

- Shailaja Salvi
- Deepa Khutwad
- Manju Gill
- B P Singh

SNAPSHOTS OF EVENTS CONDUCTED



Workshop on Export marketing for Processed Fruits & Vegetables at MCCIA, Pune



Buyer Seller Meet for Strawberry Growers and F&V Processing Industries

SIMPLE SCREENING TEST FOR DETECTING ADULTERATION IN COMMON FOOD

Contributed by: Mr. U. R. Gotkhindikar

Sr.No	Name of Food article	Adulterant	Simple method for detection of Adulterant
1	Vegetable oil	Argemone Oil	Add concentrated Nitric Acid to the sample and shake carefully. Red to reddish brown colour in acid layer would indicate the presence of Argemone oil.
		Mineral oil	Take two ml of edible oil and add an equal quantity of N12 Alcoholic Potash. Heat in boiling water bath for about 15 minutes and add 10 ml of Any turbidity shows presence of mineral oil.
		Castor oil	Take about one ml of the oil, add 10 ml of acedified petroleum ether and mix well, Add a few drops of ammonium molybdate reagent. Immediate appearance of white turbidity indicates the presence of castor oil.
2	Ghee or Butter	Mashed Potato	Sweet Potato, etc. Boil 5 ml of the sample in a test tube. Cool and a drop of iodine solution. Blue colour indicates presence of Starch.
		Vanaspati	Take 5 ml of the sample in a test tube. Add 5 ml of Hydrochloric acid and 0.4 ml of 2% furfural solution or sugar crystals. Insert the glass stopper and shake for 2 minutes. Development of a pink or red colour indicates presence of Vanaspati in Ghee.
		Rancid stuff (old ghee)	Take one teaspoon of melted sample and 5 ml. of HCl in a stoppered glass tube. Shake vigorously for 30 seconds. Add 5 ml. of 0.1% of ether solution of Phloroglucinol. Restopper & shake for 30 seconds and allow to stand for 10 minutes. A pink or red colour in the lower (acid layer) indicates rancidity.
		Synthetic Colouring Matter	Pour 2 gms of filtered fat dissolved in ether. Divide into 2 portions. Add 1 ml. Of HCl to one tube. Add 1 ml. Of 10% NaOH to the other tube. Shake well and allow to stand. Presence of pink colour in acidic solution or yellow colour in alkaline solution indicates added colouring matter.
3	Milk	Water	1. The Lactometer reading should not ordinarily be less than 1.026. 2. The presence of water can be detected by putting a drop of milk on a polished vertical surface. The drop of pure milk either stops or flows slowly leaving a white trail behind it. Whereas milk adulterated with water will flow immediately without leaving a mark.
		Starch	3. Add a few drops tincture of Iodine, Indication of blue colour shows the presence of Starch.
		Urea	4. Take 5 ml of milk in a test tube and add 2 drops of bromothymol blue solution. Development of blue colour after 10 minutes indicate presence of Urea.
4	Honey	Invert sugar/jaggery	1. Fiehe's Test: Add 5 ml. Of solvent ether to 5 ml. of honey. Shake well and decant the ether layer in a petri dish. Evaporate completely by blowing the ether layer. Add 2 to 3 ml. Of resorcinol (1 gm. Of resorcinol resublimed in 5 ml. Of conc. HCl.) Appearance of cherry red colour indicates presence of sugar/jaggery. 2. Aniline Chloride Test : Take 5 ml. Of honey in a porcelain dish. Add Aniline Chloride solution (3 ml of Aniline and 7 ml. Of 1:3 HCl) and stir well. Orangeread colour indicates presence of sugar.
		Water	A cotton wick dipped in pure honey burns when ignited with a match stick. If adulterated presence of water will not allow the honey to burn, if it does will produce a cracking sound.
5	Sugar	Chalk Powder	Dissolve sugar in a glass of water, chalk will settle down at the bottom,
6	Common Salt	White powdered stone	Stir a spoonful of sample salt in water. Chalk will make the solution white and other insoluble impurities will settle down.
7	Red Chilly Powder	Brick powder, salt powder or talcum powder	Take a teaspoonful of chilli powder in a glass of water. Coloured water extract will show the presence of artificial colour. Any grittiness that may be felt on rubbing the sediment at the bottom of glass confirms the presence of brick powder / sand and soapy and smooth touch of the white residue at the bottom indicates the presence of soapstone.
		Colour	Water soluble artificial dye can be detected by sprinkling a small quantity of chilly powder on the surface of water containing in glass tumbler. The soluble dye will immediately start descending in colour streaks.
8	Turmeric Powder	Starch of maize, wheat, tapioca, rice	A microscopic study reveals that only pure turmeric is yellow coloured, big in size and has an angular structure. While foreign/added starches are colourless and small in size as compared to pure turmeric starch.
		Lead Chromate	Ash the sample. Dissolve it in 1:7 Sulphuric acid (H ₂ SO ₄) and filter. Add 1 or 2 drops of 0.1% diphenylcarbazide. A pink colour indicates presence of Lead Chromate.
		Metanil Yellow	Add few drops of concentrated Hydrochloric acid (HCl) to sample. Instant appearance of violet colour, which disappears on dilution with water, indicates pure turmeric. If colour persists Metanil yellow is present.
9	Coriander Powder	Dung powder	Soak in water. Dung will float and can be easily detected by its foul smell.
		Common salt	To 5 ml of sample add a few drops of silver nitrate. White precipitate indicates adulteration.
10	Black Pepper	Dried seeds of papaya fruit	Papaya seeds can be separated out from pepper as they are shrunken, oval in shape and greenish brown or brownish black in colour. The suspected papaya seeds in black pepper sample is distinguishable by its characteristic repulsive flavour, quite distinct from the bite of black pepper.
		Light Black Pepper	Float the sample of black pepper in alcohol (rectified spirit). The black pepper berries sink while the papaya seeds and light black pepper float.
		Coated with Mineral oil	Black pepper coated with mineral oil gives kerosene like smell.

11	Cumin seeds (Black jeera)	Grass seeds coloured with charcoal dust	Rub the cumin seeds on palms. If palms turn black adulteration is indicated.
12	Mustard Seeds	Argemone Seeds	Argemone seeds have rough surface and mustard seeds on pressing is yellow inside while argemone seed is white.
13	Asafoetida (Heeng)	Soap stone, other earthy matter Chalk	Shake a little quantity of powdered sample with water. Soap stone or other earthy matter will settle at the bottom. Shake sample with Carbon tetrachloride (CCl ₄). Asafoetida will settle down. Decant the top layer and add diluted HCl to the residue. Effervescence shows presence of chalk.
14	Badi Elaichi seeds	Choti Elaichi seeds	Separate out the seeds by physical examination. The seeds of Badi Elaichi have nearly plain surface without wrinkles or streaks while seeds of cardamom have wrinkled ends.
15	Cloves	Volatile oil extracted cloves	Exhausted cloves can be indicated by its small size and shrunken appearance. The characteristic pungent taste of genuine cloves is less pronounced in exhausted cloves.
16	Saffron	Dyed tendrils	Genuine Saffron will not break easily like artificial. Artificial saffron is prepared by soaking maize cob in sugar and colouring it with coal – tar dye. The colour dissolves in water, if it is artificially coloured. A bit of pure saffron when allowed to dissolve in water will continue to give its saffron colour so long it lasts.
17	Green vegetables	Malachite green	Take a small part of the sample & place it over a moistened white blotting paper, the impression of the colour on paper indicates the presence of malachite green
18	Dals / Pulses	Khesari dal(Lathyrussativus)	Add 50 ml. Of diluted HCl to a small quantity of dal and keep on simmering water for about 15 minutes. The pink colour, if developed indicates the presence of Kesari dal.
		Clay, stones, gravels, etc.	Visual examination will detect these adulterants.
		(Lead Chromate) (Yellow) / Metanil yellow	Shake five grams of dal with five ml. of water and add a few drops of Hydrochloric Acid. Pink colour shows presence of Lead Chromate. Add Concentrated HCL to a small quantity of dal in a little amount of water. Immediate development of pink colour indicates the presence of metanil yellow & similar colour dyes.
19	Rawa	Iron fillings	By moving a magnet through it, iron fillings can be separated

VARIOUS ADULTERANTS/CONTAMINANTS AND THEIR EFFECTS

By: Dr. P. K. Jaiswal (Formerly Director of Laboratories, Central AGMARK Laboratory, DMI, GOI., Ministry of Agriculture)

Adulteration in food is normally present in its most crude form. Prohibited substances are either added or partly or wholly substituted. In India normally the contamination/adulteration in food is done either for financial gain or due to carelessness and lack in proper hygienic condition of processing, storing, transportation and marketing. At the end of the process consumer is either cheated or he falls prey to diseases. Such types of adulteration are quite common in developing countries or backward countries. However, adequate precautions taken by the consumer at the time of purchase of such products can help him avoid procurement of such food. Some of the common Food Adulterants and their effects on human body are as follows:-

S.No	Adulterant	Foods Commonly Involved	Diseases or Health Effects
Adulterants in food			
1	Argemone seeds	Mustard seeds	Epidemic dropsy, Glaucoma, Cardiac arrest
2	Artificially coloured foreign seeds	Edible oils and fats	
		As a substitute for cumin seed, Poppy seed, black pepper	Injurious to health
3	Foreign leaves or exhausted tea leaves, saw dust artificially coloured	Tea	Injurious to health, cancer
4	TCP	Oils	Paralysis
5	Rancid oil	Oils	Destroys vitamin A and E
6	Sand, marble chips, stones, filth	Food grains, pulses etc.	Damage digestive tract
7	Lathyrus sativus	Khesari dal alone or Mixed in other pulses	Lathyrism (crippling spastic paraplegia)
Chemical Contamination			
8	Mineral oil (white oil, petroleum fractions)	Edible oils and fats, Black pepper	Cancer
9	Lead chromate	Turmeric whole and powdered, mixed spices	Anemia, abortion, paralysis, brain damage
10	Methanol	Alcoholic liquors	Blurred vision, blindness, death
11	Arsenic	Fruits such as apples sprayed over with lead arsenate	Dizziness, chills, cramps, paralysis, death
12	Barium	Foods contaminated by rat poisons (Barium carbonate)	Violent peristalsis, arterial hypertension, muscular twitching, convulsions, cardiac disturbances
13	Cadmium	Fruit juices, soft drinks, etc. in contact with cadmium plated vessels or equipment. Cadmium contaminated water and shell-fish	'Itai-itai (ouch-ouch) disease, Increased salivation, acute gastritis, liver and kidney damage, prostrate cancer
14	Cobalt	Water, liquors	Cardiac insufficiency and myocardial failure
15	Lead	Water, natural and processed food	Lead poisoning (foot-drop, insomnia, anemia, constipation, mental retardation, brain damage)
16	Copper	Food	Vomiting, diarrhoea
17	Tin	Food	Colic, vomiting
18	Zinc	Food	Colic, vomiting
19	Mercury	Mercury fungicide treated seed grains or mercury contaminated fish	Brain damage, paralysis, death

NOTE : Safe limits have been prescribed for above metals in different food. Continuous use of food contaminated with these metals beyond safe limits may cause these diseases

Bacterial contamination			
20	Bacillus cereus	Cereal products, custards, puddings, sauces	Food infection (nausea, vomiting, abdominal pain, diarrhoea)
21	Shigella sonnei	Milk, potato, beans, poultry, tuna, shrimp, moist mixed foods	Shigellosis (bacillary dysentery)
22	Staphylococcus aureus Enterotoxins-A,B,C,D or E	Dairy products, baked foods especially custard or cream-filled foods, meat and meat products, low-acid frozen foods, salads, cream sauces, etc	Increased salivation, vomiting, abdominal cramp, diarrhoea, severe thirst, cold sweats, prostration
23	Clostridium botulinus toxins A,B,E or F	Defectively canned low or medium-acid foods; meats, sausages, smoked	Botulism (double vision, muscular paralysis, death due to respiratory failure) vacuum-packed fish, fermented food etc.
24	Diethyl stilbestrol (additive in animal feed)	Meat	Sterlites, fibroid tumors etc.
25	3,4 Benzopyrene	Skoked food	Cancer
26	Excessive solvent residue	Solvent extracted oil, oil cake etc.	Carcinogenic effect
27	Non-food grade or contaminated packing material	Food	Blood clot, angiosarcoma, cancer etc.
28	Non-permitted colour or permitted food colour beyond safe limit	Coloured food	Mental retardation, cancer and other toxic effect.
29	BHA and BHT beyond safe limit	Oils and fats	Allergy, liver damage, increase in serum chloolesterol etc.
30	Coumarin and dihydro coumarin	Flavoured food	Blood anticoagulant
31	Food flavours beyond safe limit	Flavoured food	Chances of liver cancer
32	Brominated vegetable oils	Cold drinks	Anemia, enlargement of heart
33	Sulphur dioxide and sulphite beyond safe limit	In variety of food as preservative	Acute irritation of the gastro-intestinal tracts etc.
34	Artificial sweeteners beyond safe limit	Sweet foods	Chances of cancer
Fungal contamination			
35	Aflatoxins	Aspergillus flavus-contaminated foods such as groundnuts, cottonseed, etc.	Liver damage and cancer
36	Entamoeba histolytica	Raw vegetables and fruits	Amoebic dysentery
37	Virus of infectious Hepatitis (virus A)	Shell-fish, milk, unheated foods contaminated with faeces, urine and blood of infected human	Infectious hepatitis
38	Machupo virus	Foods contaminated with rodents urine, such as cereals	Bolivian haemorrhagic fever
Natural Contamination			
39	Flouride	Drinking water, sea foods, tea, etc.	Excess fluoride causes fluorosis (mottling of teeth, skeletal and neurological disorders)
40	Oxalic acid	Spinach, amaranth, etc.	Renal calculi, cramps, failure of blood to clot
41	Gossypol	Cottonseed flour and cake	Cancer
42	Cyanogenetic compounds	Bitter almonds, apple seeds, cassava, some beans etc.	Gastro-intestinal disturbances
43	Polycyclic Aromatic Hydrocarbons(PAH)	Smoked fish, meat, mineral oil-contaminated water, oils, fats and fish, especially shell-fish	Cancer
44	Phalloidine (Alkaloid)	Toxic mushrooms	Mushroom poisoning (Hypoglycemia, convulsions, profuse watery stools, severe necrosis of liver leading to hepatic failure and death)
45	Solanine	Potatoes	Solanine poisoning (vomiting, abdominal pain, diarrhoea)
46	Nitrates and Nitrites	Drinking water, spinach, rhubarb, asparagus, etc. and meat products	Methaemoglobinaemia especially in infants, cancer & tumours in the liver, kidney, trachea The liver is the initial site oesophagus & lungs. but afterwards tumours appear in other organs.
48	Asbestos (may be present in talc, Kaolin, etc. and in processed foods)	Polished rice, pulses, processed foods containing anti-caking agents, etc	Absorption in particulate form by the body may produce cancer
49	Pesticide residues (beyond safe limit)	All types of food	Acute or chronic poisoning with damage to nerves and vital organs like liver, kidney, etc.
50	Antibiotics (beyond safe limit)	Meats from antibiotic-fed animals	Multiple drug resistance hardening of arteries, heart disease

REGULATORY / LEGAL EXPERTS PANEL AT NAFARI PREMISES

The following services are being provided by the panel on selected days at NAFARI, MCCIA Building, Tilak Road, Pune 411002

- PFA, FPO, AGMARK, Commodity Act etc
- Packaging / Labeling
- Labour Laws
- Weights and Measures
- Excise, Sales tax, Income tax.
- Factory Act
- Promotional Schemes by

PLEASE CONTACT THE FOLLOWING PERSONS TO SOLICIT THE SERVICES
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