

# INTRODUCTION

## About Us

**The State Grading Laboratory (F&V) carries out routine Chemical and Microbiological analysis of a variety of food and agricultural products and raw materials used in their production**

**It also takes projects in problem solving for the food industry.**

**The Laboratory believes in addressing all customer needs**

**Grading and Marking of agricultural produce as per the standards of AGMARK under the provision of General Grading and Marking Rules under Agricultural Produce (Grading and Marking) Act, 1937, as amended from time to time, is one of the basic functions of the Directorate of Agricultural Marketing, Govt. of NCT of Delhi. The Directorate of Agricultural Marketing is the Designated Authority for this purpose in Delhi.**

## Inception of the State Grading Laboratory

Prior to 1976, the State Grading Laboratory was functioning as the Delhi State Multipurpose Laboratory for the grading of ground spices, honey and vegetable oils under AGMARK as per the approval of the Directorate of Marketing and Inspection, Ministry of Agriculture, Govt. of India, vide their letter No. F. 76/10/70 D1 dt. 17.03.1973. With the approval of the Directorate of Marketing and Inspection, Ministry of Agriculture, Govt. of India, vide their letter No. F. 76/10/70/DI-QC-I/1628 dt. 14.10.1988, the grading of ghee under AGMARK at the State Grading Laboratory was also added besides Honey, Vegetable Oils, Butter, Wheat, Atta, Besan and Ground Spices. Ninety-One packers are attached with the State Grading Laboratory for availing the facility of grading under AGMARK.

## Augmentation of SGL for Fruits & Vegetables

The Govt. of India vide Notification No. GSR-220 dt. 14.06.2004 had notified Fruits and Vegetables Grading & Marking, Rules 2004, under the Agricultural Produce Grading and Marking Act, 1937 (as amended from time to time) for 18 major commodities like Mango, Onion, Grapes, Cabbage, Tomato, Banana and Apples etc. The above Rules stipulates that for domestic consumption grading of Fruits and Vegetables should have to be done as per the requirements of PFA Act and for export purposes the recommendations of Codex Alimentarius Commission are to be followed. In both the cases the trace analysis for the determination and measurement of contamination due to pesticides residues, aflatoxins, heavy metals and microbial loads are required to be

carried out. Accordingly, the Directorate decided to augment the facilities of the State Grading Laboratory for Standardization and Grading of Fruits and Vegetables. The Govt. of India was requested for the guidance and as per the guidance given by the Additional Agricultural Marketing Adviser to Govt. of India, Ministry of Agriculture, Department of Agriculture and Cooperation, Directorate of Marketing and Inspection vide his D.O. letter No. Q.11047/Misc./9/2000-QC.1 dt. 31.05.2004, the project was conceived under the Plan Scheme of the Directorate.

Under the Plan project “Augmentation of State Grading Laboratory”, the State Grading Laboratory (F&V) for the standardization and grading of fruits & vegetables as per the norms prescribed under the Grading & Marking Rules of Fruits & Vegetables 2004 has been set-up for the qualitative and quantitative analysis food and agricultural products.

## ACCREDITATION OF THE SGL (F&V)

The **Quality Council of India** has formed different bodies for **Accreditation and Certification of laboratories**.

- Accredited by **National Accreditation Board for Testing and Calibration Laboratories (NABL)** in Microbiological and Chemical Testing.
- Recognised by **Agricultural & Processed Food Products Export Development Authority (APEDA)** for the exporter of South East Asian countries.
- Certified by ISO: 9001:2000.
- Recognised by Directorate of Marketing & Inspection (DMI), Govt. of India is certified the lab for the analysis of the active component in spices and honey, which are the compulsory parameter for Agmark grading and grading, can't be done without these parameters.

## NABL Accredited Tests

Samples	Chemical Tests	Charges in Rupees	Biological Tests	Charges in Rupees
Fresh Fruits & Vegetables	<b>Heavy Metals</b>		<b>Aerobic Plate Count</b>	<b>100/-</b>
	<b>Lead</b>	<b>100/-</b>	<b>Coliform Bacteria</b>	<b>100/-</b>
	<b>Copper</b>	<b>100/-</b>	<b>Yeast &amp; Mould Count</b>	<b>100/-</b>
	<b>Arsenic</b>	<b>100/-</b>	<b>E.coli</b>	<b>100/-</b>
	<b>Tin</b>	<b>100/-</b>	<b>Salmonella</b>	<b>200/-</b>
	<b>Zinc</b>	<b>100/-</b>	<b>S.aureus coagulase +ve/ gm</b>	<b>200/-</b>
	<b>Cadmium</b>	<b>100/-</b>	<b>Faecal streptococci</b>	<b>200/-</b>
	<b>Pesticide Residue</b>			
	<b>Organ chlorine groups</b>			

Aldrin, Dieldrin	200/-
Captafol	200/-
DDT	200/-
1.2,4 DDT	
2.4,4 DDT	
3.2,4 DDE	
4.4,4 DDE	
Endosulfan	200/-
1.Afa	
2.Beta	
Hexachloro Cyclohexane	200/-
1.Afa	
2.Beta	
3.gama(lindane)	
4.Delta	
Heptachlor	200/-
<b>Organo phosphorous groups</b>	
Dimethoate	200/-
Fenitrothion	200/-
Malathion	200/-
Parathion	200/-
Parathion methyl	200/-
Chloropyrifos	200/-
Ethion	200/-
Formothion	200/-
Monocrotophos	200/-
Thiometon	200/-
Fenthion	200/-
Phorate	200/-
<b>Other pesticides</b>	
Carbaryl	200/-
Aldicarb	200/-

## Other Facilities Available

Parameter of testing	Charges in Charges
<b>Physical tests</b>	
Colour	50
Odour	50
PH	50
Taste	50
Dispersibility	50
Consistency	50
Softness	50

<b>Cooking Time</b>	50
<b>Sample Characteristics (Sieve Analysis)</b>	50
<b>Objectionable Matter</b>	50
<b>Particle size</b>	50
<b>Extraneous matter</b>	50
<b>Bulk Density</b>	50
<b>Identification</b>	100
<b>Refractive index at 40<sup>0</sup>C</b>	100
<b>Sensory Analysis</b>	100
<b>Food Grade Testing</b>	100
<b>(Overall Migration Test)</b>	
<b>Chemical tests</b>	
<b>Calories</b>	200
<b>Protein</b>	200
<b>Fat</b>	200
<b>Total ash</b>	100
<b>Acid insoluble ash</b>	100
<b>Moisture Content</b>	50
<b>Crude Fibre/Dietary Fibre</b>	500
<b>Calcium</b>	100
<b>Potassium</b>	100
<b>Iron</b>	100
<b>Iodine</b>	-
<b>Vitamin D</b>	200
<b>Vitamin A</b>	200
<b>Ascorbic acid</b>	200
<b>Folic Acid</b>	200
<b>Vitamin B12</b>	200
<b>Acidity (Total)</b>	100
<b>Alkalinity-Total</b>	100
<b>Water Insoluble matter</b>	100
<b>Water Insoluble matter other than</b>	100
<b>Sodium Chloride</b>	
<b>Chloride content as Sodium Chloride</b>	100
<b>Anti caking agent</b>	100
<b>Acidity ash</b>	100
<b>Starch</b>	300
<b>Inorganic matter</b>	200
<b>Assay – Saponins</b>	250
<b>Volatile Organic Sulphur compounds</b>	300
<b>Argemone oil test</b>	300

<b>Sulphate</b>	200
<b>Sulphated Ash</b>	100
<b>Uric Acid</b>	200
<b>Lead chromate</b>	200
<b>Curcuminoid content</b>	250
<b>Saponification value</b>	250
<b>Unsaponifiable matter</b>	250
<b>Acid value</b>	100
<b>Mineral Acid (by GC)</b>	250
<b>Acidity as Citric acid</b>	100
<b>Acidity of vinegar as Acetic acid</b>	100
<b>Rice Bran in oil</b>	200
<b>Specific gravity</b>	50
<b>Reducing Sugars</b>	200
<b>Sucrose content</b>	200
<b>Gluten content</b>	200
<b>Heating unit for chilies (Scoville index)</b>	100
<b>Salt content</b>	100
<b>Heavy Metals (by ICP)</b>	
<b>Lead</b>	100
<b>Zinc</b>	100
<b>Mercury</b>	100
<b>Cadmium</b>	100
<b>Arsenic</b>	100
<b>Chromium</b>	100
<b>Boron</b>	100
<b>Copper</b>	100
<b>Manganese</b>	100
<b>Iron</b>	100
<b>Aluminium</b>	100
<b>Magnesium</b>	100
<b>Nutritional Information</b>	
<b>Nutritional Labeling as per PFA</b>	500
(Parameters included: Energy value, Carbohydrate, sugar, Protein, Fat)	
<b>Nutritional Labeling</b>	1500
(Parameters included: Energy value, Calories from fat, Carbohydrate, Protein, Fat, Saturated fat, Trans fat, Monounsaturated fat (MUFA), Polyunsaturated fat (PUFA), Dietary	

<b>Fiber, Sugar, Cholesterol, Vitamin A, Vitamin C, Calcium, Sodium, Iron/Potassium)</b>	
<b>Shelf-life Study (Accelerated)</b>	
Shelf-life study for 6 months or less	1000
Shelf-life study for 1 year	1500
<b>Pesticide residue</b>	
Pesticide residue (total)	700
Pesticide residue (individual)	200
Pesticides (Group)	300each
(i) Organophosphorus	
(ii) Organochlorine	
(iii) Carbamates	
(iv) Herbicides	
<b>Aflatoxin</b>	
Aflatoxins (Total) by ELISA	300
Aflatoxin-B1 (by HPLC)	200
<b>Microbiological Tests</b>	
Total Plate Count	100
Total yeast & mould count	100
Coli form Count	100
E.coli	100
Faecal Streptococci	200
Salmonellae (per 25g sample)	200
Bacillus cereus	200
Pseudomonas aeruginosa	200
Staphylococcus aureus	200
Shigella spp.	200
Vibrio parahaemolyticus	200
Clostridium perfringens	300
Listeria monocytogenes	300
Anaerobic spore count	200
Yeast & spore count	200
Proteolytic & Lipolytic bacteria	200
Thermophilic bacterial count	200
Incubation Test for 7 days	200
Incubation Test for 15 days	200
<b>Personnel/Equipment Swab Analysis</b>	
Swab Test (TPC, Coli form, E.coli, Salmonella)	400
Swab Test (TPC, Coli form, E.coli)	300
Swab Test (TPC, Coli form)	200

Swab Test (TPC/Coli form)	200
Microbial identification by MIDI	400

### ACTIVE COMPONENT IN SPICES AND HONEY AS PER AGMARK

Sl. No.	Products	Test Parameter	Charges for Analysis
1.	Turmeric Powder	Curcumin	200/-
2.	Pepper	Piperine	350/-
3.	Red Chillies	Capsaicin	350/-
4.	All Spices	Salmonella	250/-
5.	Honey	HMF contents	250/-
6.	Spices	All tests (Combined)	400/-

### List of Samples Routinely Analyzed

Fruits & Vegetables and products  
 Spices & Pulses  
 Bakery Products  
 Dairy Products  
 Possessed Food  
 Canned Products  
 All Meat Products  
 Confectionery  
 Beverages  
 Oils

### FACILITIES OFFERED

- Nutritional Labelling.
- Microbiological tests.
- Shelf life testing.
- Chemical tests.
- Vitamin analysis.
- Fatty acid profile with transfat and omega 3.
- Aflatoxin analysis.
- Pesticide analysis.
- Consultancy and problem solving.
- Drinking Water as per IS:10500 and packaged drinking water as per IS:14543 & 13428.

## **THE GOAL**

The SGL (F&V) Laboratory aims at being a one stop laboratory for all food analysis and guidance required by the food industry for raw materials and finished products.

It aims to meet all quality testing requirements to international standards and provide accurate, speedy, traceable analytical reports.

In addition to the analytical work, following R&D and Academic Programme shall also be undertaken: -

### **Short Term R&D**

**01. To develop eco-friendly methods to remove Pesticides Residues and Microbial Loads without using chemical or corrosives like hot water, steam, mild soap washing, cleaning and scrubbing methods.**

### **Long Term R&D**

- 01. Reduction of post harvest decay by heat treatment and using irradiation like UV and microwave.**
- 02. Modified atmospheres as the storability of fruits and vegetables.**
- 03. Edible coatings (eco-friendly coating)/natural seal on vegetables to increase shelf life and to reduce decay.**
- 04. Innovative packaging & transportation strategies keeping in view our farming practice, kind of roads and transportation used by our farmers and traders in our country.**
- 05. Development of quick testing procedures for pathogens, pesticide residues on agricultural produce, which can be done on farm and in wholesale Mandi. Things like biosensors, Elisa based dip-strip methods / procedures.**
- 06. Value addition and development of agricultural produce into Nutraceuticals.**

## **OTHER SERVICES**

- **Food handler training course.**
- **Audits of food handling / manufacturing units.**
- **Hygiene monitoring**
  - **Air count**
  - **Swabs**
- **Problem solving with reference to quality related issues on site.**
- **Training on Food Safety and Quality Management System.**



## **THE GROUP**

**The State Grading Laboratory (F&V) has a team of young, enthusiastic, sincere and dedicated food technologists, analysts and microbiologists. The laboratory is headed by the Director, Directorate of Agricultural Marketing.**

## **Contact Detail**

**The State Grading Laboratory (F&V)**

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