



Centre for Food Research & Analysis (CFRA), NIFTEM

An Accredited Food Testing Laboratory

A component of International Center of Excellence in Food Safety & Quality
with Integrated accreditation from:-



Quality is Not Optional !

National Institute of Food Technology, Entrepreneurship and Management
Plot No. 97, Sector-56, HSIIDC Industrial Estate, Kundli, Sonapat, Haryana

ABOUT NIFTEM

National Institute of Food Technology Entrepreneurship and Management (NIFTEM) is a Deemed-to-be University under the De-novo category. It is an autonomous institution setup by the Ministry of Food Processing Industries, Government of India to cater to the needs of various stakeholders of the food sector i.e. entrepreneurs, industry, exporters, regulators, policy makers, the government and the existing institutions and for the development of skilled human resource in the country. NIFTEM plays a pivotal role as a one stop solution provider related to various aspects of food processing (products, technologies, food safety management practices, entrepreneurship development, food quality and safety, commercialization etc.). NIFTEM with its five pilot plants provides incubation facilities to enable entrepreneurs to develop sustainable business.

International Centre of Excellence in Food Safety & Quality (ICEFSQ)

During the present era of globalization and global food trade, it is essential to address the present day issues of food safety and quality and to enable and facilitate our agri-produce and the processed food products. NIFTEM has established an International Centre of Excellence in Food Safety & Quality.

Objectives of Centre of Excellence

1. Serve the industry by providing an accredited state of art Food testing laboratory for certification of food products for ensuring their quality and safety.
2. Undertake Projects related to Analytical studies for providing solutions to the food industry.
3. Conduct training programs for up gradation of skills for :
 - Upgradation of skills for the use of various sophisticated analytical techniques for analysis of food products
 - Quality management systems, audits and implementation
 - Food laws and food regulations etc.
 - CODEX activities for harmonization of food standards and setting up of MRL values.
4. Serve as Center for CODEX and support for FSSAI.
5. Serve as Centre for Regulators and Policy makers for undertaking studies for Risk Assessment.
6. Serve as one of the referral laboratory for the country.

Centre for Food Research and Analysis (CFRA), NIFTEM

CFRA, NIFTEM is an accredited state-of-art well established analytical laboratory with integrated assessment from NABL, APEDA & FSSAI has the capabilities of not just carrying out quality control and certification of food products at different stage of supply chain but also provides technical support related to analytical studies to food processing industries and help in developing standards and test protocols for various quality parameters essential for both raw and processed products for the domestic and international market. The CFRA undertakes projects to provide solutions to the problems being faced by the food industry related to their requirements.

Objective of CFRA, NIFTEM

- ❑ Studies for quality certification of raw and processed foods for Physico-chemical, Nutritional, Microbiological and Sensory Parameters.
- ❑ Safety evaluation of food products w.r.t. residues of various toxicants & contaminants and presence of adulterants.
- ❑ New Analytical Method development and Validation.
- ❑ Residual and Persistence studies of Agrochemicals in crops, water and soil.
- ❑ Shelf life and enhancement of shelf life.
- ❑ Development and characterization of new packaging material and studies on food packaging interactions and compatibility.
- ❑ Analytical data related to development and improvements/modifications of products and processes.
- ❑ Studies related to development of nutraceuticals and functional foods.
- ❑ Studies for food fortification.

Categories of Products for Studies

- | | | |
|------------------------------|---|---|
| ◆ Milk and dairy products | ◆ Oil and Fats | ◆ Raw and processed fruits and vegetables. |
| ◆ Meat, marines and poultry | ◆ Alcoholic and non-alcoholic beverages | ◆ Food packaging materials |
| ◆ Cereals, Grains and Pulses | ◆ Honey, Sugar and confectionery | ◆ Snacks & Bakery products |
| ◆ Ready-to-eat food | ◆ Pickles, Jams & Condiments | ◆ Food additives |
| ◆ Spices and nuts | ◆ Animal Feed | ◆ Starch and Starch products |
| ◆ Tea & Coffee | ◆ Water & Waste Water | ◆ Functional foods, nutraceuticals and food supplements |

Details of the Services Provided by CFRA, NIFTEM

1. Analysis for Residues of Toxicants & Contaminants

CFRA with its present expertise and highly sensitive and sophisticated analytical equipment can undertake the analytical work related to the presence of residues of various types of toxicants and contaminants in food products as give below:

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|--|---------------------|
| ❑ Toxic metals | ❑ Residual Solvents |
| ❑ Pesticides & Plant growth regulators | ❑ Mycotoxins |
| ❑ Dyes and Colourants | ❑ Pathogens |
| ❑ Antibiotics & Veterinary drugs | ❑ GMOs |
| ❑ Environmental contaminants | ❑ NOTS |

2. Analysis for Nutritional Labeling

Nutritional labeling is mandatory as per the various national and international regulatory requirements. CFRA has the facilities of certification for labeling of nutritional facts as per the guidelines of FSSAI and other international regulatory authorities in different processed and packed foods

Nutritional information		
Total fats	Saturated fats	Cholesterol
Mono & poly unsaturated fats	Trans-fats	Dietary Fiber
Proteins	Total Carbohydrate	Added Colours
Sugar	Energy	Minerals
Antioxidants	Trace elements	Vitamins

3. Quality Evaluation and Certification of Raw and Processed Food products for Various Physical, Chemical, Biological, Sensory and Rheological Parameters

Physical and Rheological Parameters		
Insect infestation	Admixture	Colour on lovibond scale
Bellier turbidity temperature	Refractions	Optical rotation
pH	Refractive index	Specific gravity
Microscopic examination	Scorched particles	Falling number
Texture profile	Viscosity	Water absorption capacity
Elasticity and Extensibility of Dough	Flash Point	Conductivity



Chemical Parameters		
Moisture	Amino acid profile	Water & Oil soluble Vitamin
Starch	Ethyl alcohol	Acid insoluble ash & Suphated ash
Organic Acid	Methyl alcohol	Gluten
Sugar Profile	Higher alcohol	Alpha amylase activity
Soluble fiber	Esters	Phosphatase activity
Crude fiber	Flavonoids	Food Additives
Dietary fiber	Volatile Organic Compound	Food Colors
Insoluble fiber	Phytosterols	Flavours & Fragrances
Fat/Oil content	Tannins	Artificial Sweeteners
Fatty Acid Profile	Phyto-chemicals	Antioxidants
Tri halo methane	Sulphated ash	Emulsifiers, Colors
Uric Acid	Aldehyde/furfurals	Cations/Anions
Terpineol	Cellulose	HMF

Biological Contaminants	Chemical Contaminants and Adulterants
E.coli	Urea, Detergents etc.
Salmonella	Mineral Oils
S.aureus	Starch in diffeient food product
Shigella	Preservatives (Fomaldehyde, hydrogen peroxide)
Campylobacter	Sugars in Honey
Bacillus cereus	Argemone, Gossypol, Kesri Dal etc.
Pseudomonas	Melamine
Clostridium sp.	Animal Fat in ghee/vegetable Oil
Total Bacterial Count	Banned / Non-permitted dyes, Melamin etc.
Yeast and Mould Count	Tri ortho cresyl Phosphate (TOCP)



4. Food Packaging Materials

CFRA conducts various tests on packaging materials and offers a wide range of R & D and consultancy services with respect to:

- ◆ Improvement in quality of packaging products
- ◆ Characterization of Packaging Material
- ◆ Suitability of packaging material for different types of food products i.e., container compatibility studies
- ◆ Migration studies for different components e.g., monomers, additives, stabilizers, material etc from packaging materials

5. Quality Evaluation of Food Additives

Food additives, often present in ppm or ppb range perform a diverse range of functions in foods. The CFRA has adequate facilities to evaluate the quality of food additives before use and determine their residual levels in foods by adopting national and international standard methods as well as state-of-the-art technology. The range of capabilities include tests for artificial sweetness (aspartame, saccharin, acesulfame K, benzoate, sorbate), food colours, preservatives, emulsifiers, stablizers, antioxidants, etc.

6. Method Development and Validation of Analytical Techiniques

Analytical method development and validation, a mandatory requirement as per ISO 17025 guidelines, forms an important aspect of quality analysis. CFRA has the desired knowledge and the trained expertise for developing new analytical methods and validating them as per the various International protocols (ICH, AOAC, SANTE EU etc.) for different components in food and herbal products.

7. Studies on Product Differentiation

Today, the consumer has become more demanding about the quality, purity and value addition of the products. In this regard, CFRA, NIFTEM can undertake product differentiation studies with respect to :

- ◆ GM and Non-GM products
- ◆ Inferior & superior quality cereals and pulses
- ◆ Organic and Non-organic products
- ◆ Inferior and superior quality oilseeds
- ◆ Adulteration of food products
- ◆ Food Safety

8. Shelf life / Stability Studies of Raw & Processed Food Products

CFRA with its existing facilities can undertake studies for shelf life at both ambient and accelerated storage conditions to establish the validity of the product with respect to physico-chemical properties, water activity, microbial stability, sensory properties, rheological properties etc.

9. Studies on Enhancement of Shelf life

These days several technologies are being used for enhancement of shelf life of the food products such as modified atmosphere packaging, use of chemical preservatives, Gamma irradiation etc. CFRA, NIFTEM has the desired expertise for conducting studies related to shelf-life enhancement of food and herbal products.

10. Quality Evaluation of Animal Feed

CFRA has the adequate facilities for undertaking feed analysis and provide information related to :

- ◆ Level of nutrients in animal feeds
- ◆ Evaluation of nutritive value of new varieties of crops and fodder
- ◆ Formulation of policies, guidelines for standard and quality criteria of animal feeds

11. Quality Evaluation and Characterization of Herbal Products

Today one of the major concerns associated with the herbal products is identification of the right species of raw herbs; quality, efficacy, safety and toxicity of the product; synergistic effects with other components and quantification of the labelled ingredients.

With the facilities available at NIFTEM, the following studies can be undertaken :

- ◆ Chemical profiling and fingerprinting of different phyto-components.
- ◆ Determination of various bio-actives (Saponins, Alkaloids, Flavonoids, Polyphenols, Polysaccharides, Phyto-sterols, etc.)
- ◆ Evaluation for sanitary and phytosanitary aspects related to microorganisms and residual contaminants of pesticides, heavy metals, mycotoxins, etc.

12. Organic Certification

Organic certification involves a) Farm Certification and b) Product Certification.

CFRA with its existing facilities can play an important role in certifying products from organic farming by carrying out analysis of water used for irrigation, soil from the fields, crop during the stages of its growth, feed for live stock and product of organic produce for the following contaminants : Pesticides, herbicides & fungicides, Heavy metals, Certain nutrients, Minerals and Fertilizers, Additives etc.

List of major State of Art Analytical Equipment at CFRA

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| 1. Liquid Chromatograph-Mass Spectrometer | 17. Lovibond Tintometer |
| 2. Gas chromatograph-Mass Spectrometer with head space analyzer | 18. ELISA Reader |
| 3. Inductively Coupled Plasma-Optical Emission Spectrometre | 19. Gel Electrophoresis |
| 4. High Performance Liquid Chromatograph with all detectors | 20. Soxhlet Extraction Unit |
| 5. Gas Chromatographs with ECD, FID, NPD, TCD, FPD, head space analyzer | 21. Microwave Digestor |
| 6. Atomic Absorption Spectrometer (AAS) with FIAS and GTA | 22. Karl Fisher Automatic Titrator |
| 7. Differential Scanning Calorimeter (DSC) | 23. Glutamate System |
| 8. Thermogravimetric Analyzer | 24. Fibretech for Fibre Estimation |
| 9. UV / Visible Spectrophotometer | 25. Viscometer |
| 10. Spectrofluorometer | 26. Digital Abbe Refractometer |
| 11. FT-IR Spectrophotometer | 27. Water Activity Meter |
| 12. Texture Analyzer | 28. Conductivity Meter |
| 13. Kjeltex for Protein Estimation | 29. Nephelometer/Turbidity Meter |
| 14. Polarimeter | 30. Electronic Colony Counter |
| 15. Rancimat | 31. Bio Safety cabinet |
| 16. Elemental Analyzer | 32. Biological Oxygen Demand Incubator (BOD) |



For further queries please contact

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