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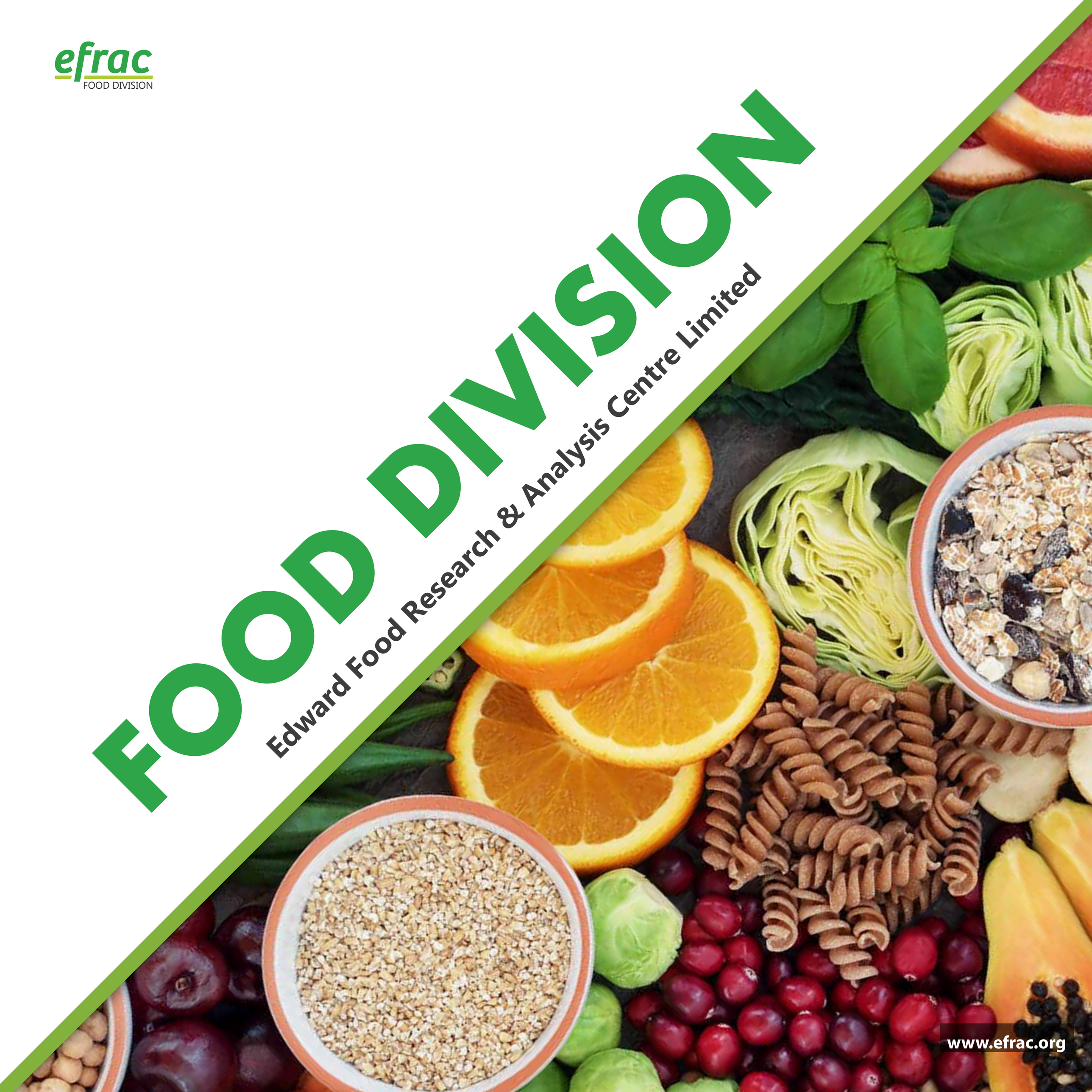
Edward Food Research & Analysis Centre Limited



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USFDA INSPECTED FACILITY

Edward Food Analysis and Research Centre Ltd., owes its origins and growth to the need for ethical, independent, specialized and informed TIC which truly upholds the maxim: “Consumer is the King” in letter and in spirit. As such, cutting corners is not our speciality.

We specialize in providing best in class client services enveloping the entire Food Testing and Analytics landscape. EFRACs Laboratory, pristinely located amidst primal surroundings, is architecturally compliant with National and International Regulations and is accredited by NABL as per ISO / IEC 17025:2017 & recognized/approved by leading National & International Standardization agencies such as Bureau of Indian Standards (BIS), Export Inspection Council India (EIC), Agricultural and Processed Food Products Export Development Authority (APEDA), AGMARK, GAFTA, SGF and FSSAI, for Food Testing and Analytics.

EFRAC, accoutered with automated, sophisticated, sensitive and calibrated Food TIC Devices and IT Systems, Validated Methodologies, Skilled and functionally trained operatives overseen by conscious Scientists is approved by FSSAI and FDA. Its seminal practice of FDA GLP and 21 CFR Part 11 Regulatory requirements on Electronic Records and Electronic Signatures (ERES) has stood scrutiny of time.

Clients have lauded EFRACs unbiased process clarity, professional ethics and relationship building practices. For EFRAC, challenges and opportunities constitute a continuum for ceaseless improvement and development ultimately benefitting the King of Democracy, aka the common Indian consumer.

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ANALYTICAL SERVICES

NUTRITIONAL LABELLING

Nutritional Labelling involves display of accurate and valid information about presence / absence of ingredients, net weight / volume, Calorific value, Preservatives / Artificial coloring agents, methodology for use and storage, shelf life (date of expiry / best before), proper package disposal, cautionary and other exceptions (allergies, physicians advice, health claim, nutritional claim, risk reduction claim) and also caters to legal requirements (including Advertisements) if any, laid down by Regulators in countries of manufacture and consumption. In India, Packaged food products sold are mandatorily required to be labelled with green and brown symbols signyfying and distinguishing vegetarian and non-vegetarian contents respectively. These requirements are stipulated in FSS (Packaging and Labelling) Regualtion, 2011 under the FSS (Packaging and Labelling) Act of 2006. EFRAC's Superior Nutritional Labelling Advantage seamlessly interfaces its nutritional testing framework for Regulatory Compliance with denotative Labelling for a lucid and captivating presentation experience.

PARAMETERS

Ash • Fat • Crude Fiber • Moisture • Protein • Carbohydrate • Energy • Sugar • Salt • Dietary Fiber • Fatty Acid Profile • Cholestrol • Vitamins • Minerals • Vitamin (A, B1, B2, B3, B5, B6, B7, B9, B12, C, D, E, K, Choline) • Amino Acid • Organic Acid • Fatty Acid (SFA, MUFA, PUFA & TFA, Omega 3 fatty acid, Omega 6 fatty acid, Omega 9 fatty acid, DHA fatty acid) • Nucleotides • L-Carnitine • Taurine • Inositol

METHODS & GUIDELINES

Indian Standard • AOAC • AOCS • ASTM • Fssai Manuals • International Organization for Standardization (ISO) • Food Chemical Codex

INSTRUMENTS

AAS • ICP-OES • ICPMS • LC-MS/MS • HPLC-PDA/RID • GC-FID • IC-Conductivity Detector • AUTO KJELDAHL • UV-Visible Spectrophotometer • LC-MS/MS • GCMS

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VITAMINS

Vitamins are labile, organic and biologically active compounds. Nutritional by nature, they are essential for maintenance of human health and wellbeing by facilitating Protein, Carbohydrate, and Fat metabolism and also by protecting from free radical damage. Humans obtain them from food or nutritional supplements. Most of these and their cognate compounds are extensively used as food or feed additives, therapeutic agents and health aids. Health & Wellbeing market is replete with Nutritional Premixes, Supplements and Nutraceuticals, each claiming benefits like no other.

PARAMETERS

Fat Soluble Vitamin :
Vitamin - A (Retinol acetate,Retinol palmitate) • Vitamin - D (Ergocalciferol, Cholecalciferol) • Vitamin - E (α -Tocopherols, β- Tocopherols, γ-Tocopherols, δ-Tocopherols, α –Tocotrienols, β-Tocotrienols, γ-Tocotrienols, δ-Tocotrienols) • Vitamin - K (Phylloquinone, Menaquinones)
Water Soluble Vitamin :
Vitamin - B1 (Thiamine) • Vitamin - B2 (Riboflavin) • Vitamin - B3 (Niacin) • Vitamin - B4 (Carnitine) • Vitamin - B5 (Panthothenic Acid) • Vitamin - B6 (Pyrodixine) • Vitamin - B7 (Biotin) • Vitamin B9 (Folate) • Vitamin - B12 (Cyanocobalamin, Methylcobalamin) • Vitamin - C (Ascorbic Acid)

METHODS & GUIDELINES

AOAC • ISO • IS • FSSAI Lab Manual • FCC • USP • Ph. Eur. • AOCS • Food chemical Codex

INSTRUMENTS

HPLC-PDA/DAD • UPLC-MS/MS • UV-Visual Spectrophotometer, Fluorometer

AMINO ACID PROFILING

Feed grade Amino Acid facilitates efficient conversion of low value vegetable protein (such as soya bean) to high value proteins (milk, meat) for Human use. Requirement of Amino Acid in Animal Feeds varies according to the specie and age of the animal. EFRAC is accredited by NABL as per ISO/IEC 17025:2017 & ISO 9001:2015 and is also recognized/approved by leading national and international agencies such as Bureau of Indian Standards (BIS), Export Inspection Council of India (EIC), Agricultural and Processed Food Products Export Development Authority (APEDA), AGMARK, GAFTA, SGF and FSSAI for food testing and analysis. Meeting or exceeding definitive National and International Regulatory benchmarks in letter as well as in spirit is all in a day's work at EFRAC. Ethical cultural framework include utilizing Skilled Personnel with studied expertise, latest Analytical Equipment, Consumables and Validated Methods to afford "look no further" Service to clients.

Our expertise in Product Content Comparison reveals Feed Nutritional information which is shared with Client thus enabling Business facilitation. EFRACs Equipment's and Methods for accurate and Amino Acid Analysis include LC MSMS i.e. Liquid Chromatography in league with Tandem Mass Spectrometry Method.

PARAMETERS

i) Non-Essential Amino Acid ii) Essential Amino Acid

L-alanine • L-arginine • L-asparagine • L-aspartic acid • L-cysteine • L-cystine • L-glutamic acid • L-glutamine • L-glycine • L-histidine • L-isoleucine • L-leucine • L-lysine • L-methionine • L-phenylalanine • L-proline • L-serine • L-threonine • L-tryptophan • L-tyrosine • L-valine • Taurine

METHODS & GUIDELINES

AOAC • ISO:13903 • Ph. Eur • USP • FCC

INSTRUMENTS

Spectrophotometer • HPLC-PDA/FLD • LC-MS/MS

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FATTY ACID PROFILING

Essential Fatty Acids (EFA's) are so termed, because of their indispensibility in biological (structural and metabolic) processes and for being a major source of energy. These are obtained from diet because humans and animals cannot synthesize them. The two primary EFA's that is lenoleic acid (Omega-6) and alpha lenoleic acid (Omega-3) are intimately involved in management of bodily inflammations. Fatty Acids are building blocks for prostaglandins which increase or decrease inflammation in the body. Most diets contain a great deal of fatty acid in the form of triacylglycerol (easters with glyerol). Fatty acids comprise hydrocarbon chains terminating in carboxylic acid groups. The length and degree of saturation of the hydrocarbon chain is highly variable and dictates associated physical properties (e.g., melting point and fluidity). Fatty acids and their associated derivatives are the primary components of and are responsible for the hydrophobic properties (insoluble in water) of lipids.

PARAMETERS

Saturated Fatty Acid: Butyric acid (C4:0) • Caproic acid (C6:0) • Caprylic acid (C8:0) • Capric acid (C10:0) • Undecanoic Acid (C11:0) • Lauric Acid (C12:0) • Tridecanoic Acid (C13:0) • Myristic Acid (C14:0) • Pentadecanoic Acid (C15:0) • Palmitic Acid (C16:0) • Heptadecanoic Acid (C17:0) • Stearic Acid (C18:0) • Arachidic Acid (C20:0) • Henicosanoic Acid (C21:0) • Behanic Acid (C22:0) • Tricosanoic Acid (C23:0) • Lignoceric Acid (C 24:0)

Mono-Unsaturated Fatty Acid: Myristoleic Acid (C14:1) • Cis -10-Pentadecanoic Acid (C15:1) • Palmitoleic Acid (C16:1) • Cis -10-Heptadecanoic Acid (C17:1) • Elaidic Acid (C18:1, Trans) , Oleic Acid (C18:1) • Eicosenoic Acid (C20:1) • Erucic Acid (C22:1) • Nervonic Acid (C24:1)

Poly-Unsaturated Fatty Acid: Linolelaidic Acid (C18:2, Trans) • Linoleic Acid (C18:2, W6) • Y- Linolenic Acid (C18:3) • Linolenic Acid (C18:3, W-3) • Cis -11-14- Eicosadienoic Acid (C20:2) • Cis-8,11,14-Eicosatrienoic Acid (C20:3n6) • Cis-11,14,17 - Eicosatrienoic Acid (C20:3n3) • Arachidonic Acid (C20:4n6) • Cis -13,16- Docosadienoic Acid (C22:2) • Eicosapentaenoic Acid (C20:5n3) • Nervonic Acid (C24:1) • Cis- 4,7,10,13,16,19-Docosahexaenoic Acid (C22:6)

Trans Fatty Acid: Elaidic Acid (C18:1) • Linolelaidic Acid (C18:2)

Omega - 3 Fatty Acid: Linolenic Acid (C18:3) • Eicosapentaenoic Acid (C20:5n3) • Eicosapentaenoic Acid (C20:5n3)
Omega - 6 Fatty Acid: Linolelaidic Acid (C18:2, Trans) • Linoleic Acid (C18:2) • Y- Linolenic Acid (C18:3) • Arachidonic Acid (C20:4n6)
Omega - 9 Fatty Acid: Elaidic Acid (C18:1, Trans) • Oleic Acid (C18:1) • Erucic Acid (C22:1) • Erucic Acid (C22:1)

METHODS & GUIDELINES

AOAC • AOCS • IS • ISO • USP • FCC • FSSAI Lab Manual

INSTRUMENTS

GC-FID • HPLC-ELSD • GC-MS/MS

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ARTIFICIAL SWEETENERS

A sugar substitute is a food additive that provides sugar like sweetness while affording significantly less calories. Some sugar substitutes may be natural or synthetic. In the United States, six high - intensity sugar substitutes have been approved for use: Aspartame, Sucralose, Neotame, Acesulfame potassium (Ace-K), Saccharin and Advantame. Food additives must be approved by the FDA and sweeteners must be proven as safe post submission of a GRAS document regarding safety of use by the manufacturer. FDA provides guidance for manufacturers and consumers about the daily limits for consuming high-intensity sweeteners, a measure called Acceptable Daily Intake (ADI). FDA established an ADI defined as an amount in milligrams per kilogram of body weight per day (mg/kg bw/d), indicating that a high-intensity sweetener does not cause safety concerns if estimated daily intakes are lower than the ADI. Sugar substitutes are used instead of sugar for a number of reasons, including: Dental care, Diabetes mellitus, hypoglycemia, Cost and shelf life.

PARAMETERS

Acesulfame potassium (Ace-K) • Aspartame • Saccharin • Sucralose • Neotame & Advantame • Identification • Specific Rotation • Loss on Drying • Residue on Ignition • Heavy Metals • Acidity or Alkalinity • Limit of Fluoride • Water Content • NOTS • Insecticide • Fungicide • Carotene • Glycerol content • Inorganic Iodide • Aromatic amines • Hydrocarbons • Nitro compounds • Particle size • Purity • Reducing Sugars • Residual Solvent • Aflatoxins • Total sulfur • Melamine

METHODS & GUIDELINES

FSSAI Lab Manual • AOAC • ISO • IS • USP • FCC

INSTRUMENTS

HPLC-PDA • UPLC-PDA

ARTIFICIAL PRESERVATIVES

Preservative is a substance or a chemical that is added to products such as food, beverages, pharmaceutical drugs, paints, biological samples, cosmetics, wood, and many other products to prevent decomposition by microbial growth or from undesirable chemical changes. In general, preservation is implemented in two modes, chemical and physical. Chemical preservation entails adding chemical compounds to the product. Physical preservation entails processes such as refrigeration or drying. These preservatives reduce the risk of food borne infections, decrease microbial spoilage, and preserve fresh attributes and nutritional quality. As Per FSSAI, Food Directorate Health Products and Food Branch Health Canada.

PARAMETERS

Sulfites • Sodium Nitrite • Propionic Acid • Sorbic Acid • Benzoic Acid • Acetic Acid • Ascorbic Acid • Erythorbic Acid • Potassium Nitrite • Methyl-ρ-hydroxy Benzoate • Methyl Paraben • Propyl Paraben • Potassium Acetate • Potassium Diacetate • Potassium Metabisulphite • Propionic acid • Propyl-ρ-hydroxy Benzoate • Ascorbyl Palmitate • Citric Acid • NOTS • Heavy Metals • Identification • Specific Rotation • Loss on Drying • Residue on Ignition • Heavy Metals • Acidity or Alkalinity • Limit of Fluoride • Water Content • NOTS • Insecticide • Fungicide • Particle size • Purity • Reducing Sugars • Residual Solvent • Aflatoxins • Total sulfur • Melamine

METHODS & GUIDELINES

FSSAI Lab manual • AOAC • ISO • IS • USP • FCC

INSTRUMENTS

HPLC-PDA • UPLC-PDA • IC-CD • GC-MS/FID • UV-VISUAL SPECTROPHOTOMETER

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FOOD COLOR

Food coloring, or color additive, is any dye, pigment or substance that imparts color when it is added to food or drink. It may be Natural or Artificial. They come in many forms consisting of liquids, powders, gels, and pastes. Food coloring is used both in commercial food production and in domestic cooking. Food colorants are also used in a variety of non-food applications including cosmetics, pharmaceuticals, home craft projects, medical devices, to make these more attractive, appealing, appetizing, and informative, to offset color loss due to exposure to light, air, temperature extremes, moisture, storage conditions and for enhancement of natural colors. Color allow consumers to identify products on sight (candy flavors or medicine dosages e.g.), protect flavors and vitamins from damage by light, increase appeal and make unattractive food desirable. In the United States, FD&C numbers (which indicate FDA's approval of the colorant for use in foods, drugs and cosmetics) are given to approved synthetic food dyes that do not exist in nature, while in the European Union, E numbers are allotted to all food dyes whether natural or synthetic, that are approved for food . The Pure Food and Drug Act of 1906, US has listed 7 permitted colors. EU directive(62/2645/EEC) has 36 approved colorants - 20 natural and 16 synthetic. In India, details of colors in the list of ingredients is not required where a decleration regarding color additings has been made on the product label as per regulation 2.2.2(5) (ii) and regulation 3.2.1 of Food Safety and Standards (Food Product Standards and Food Additive) Regulation, 2011. However, the common name or Version – I (08.05.2017) class name needs to be mentioned on the label. The synthetic colours that are permitted to be used are mentioned below.

Red from: Ponceau 4R, Carmoisine, and Erythrosine
Yellow from: Tartrazine and Sunset Yellow FCF
Blue from: Indigo Carmine and Brilliant Blue FCF
Green from: Fast Green FCF

PARAMETERS

Total Dye Content • Volatile Matter (chloride & sulphate) • Solubility In • Water • Combined Ether Extract • Water Insoluble • Light Stability • Heat Stability • Alkali Stability • Subsidiary Dyes • Dyes Intermediate • Heavy metal • Partical Size • Bulk Density • pH Value • Heavy metal • NOTS • Erythrosine β-carotene • Chlorophyll • Riboflavin • Tartrazine • Sunset Yellow • Indigo Carmine • Caramel • Annatto • Coumarin and dihydrocoumarin • Tonkabean • Estragole • Chlorophyll • Caramel • Curcumin • Beta carotene • Beta apo-8 carotenal • Saffron • Ponceau 4R • Carmoisine • Erythrosine • Sunset Yellow FCF • Indigo carmine • Brilliant blue FCF • Fast green FCF • Rhodamine B • Allura red • Auramine • Yellow G • Heavy Metals • Melamine • Mycotoxins • LOI • LOD

METHODS & GUIDELINES

AOAC • ISO • IS • FSSAI Lab Manual • FCC • USP • AOCS

INSTRUMENTS

HPLC-PDA/DAD • UPLC-PDA • UPLC-MS/MS • UV-Visible Spectrophotometer • ICPMS • AAS-Flame/GTA

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PESTICIDE RESIDUE

Misinformed and indescriminate use of Pesticide in commercial farming has scarred soil and environment with chemical residues, extensively contaminating the food chain and slow poisoning the consumers. Globally, Farming Networks have clamped down by banning certain pesticides, regulating use of others and motivating preferential use of Organic fertilizers. The Food Regulators have followed by setting stringently specific standards for pesticide residues in Food and followed it up by rigorously monitoring shipments both at the ports of origin and call, often rejecting consignments leading to massive losses for exporters. Our Pesticide Testing Facility is renowned for using validated Equipment and Methods for precise detection, quantification and characterization of assorted pesticide residues in conformance with national and international Methods. Our customized remedial advisories strengthen manufacturing systems to preclude shortfalls and avert aberrations. Residue pharmacologically active substance in food chain meant for export is a concern of regulatory (EIC) to meet the importing country requirement. EFRAC Lab has the capability and competency to test Pesticide Residue active substance as per EU requirement given in Commission Decision 2002/657/EC and other specific community legislation documents No. SANTE/11813/2017, Commission regulation (EC) No 333/2007and commission No 401, commission legislation no-644/2017.

PARAMETERS

Insecticides • Herbicides • Rodenticides • Bactericides • Fungicides • Larvicides • Algicides • Avicides • Fungicides • Miticides • Molluscicides • Nematicides • Slimicides • Virucides • Insect Growth Regulators

METHODS & GUIDELINES

Quecher's Method • AOAC • EPA Method • US FDA • FSSAI Lab Manual • ISO • IS • WHO

INSTRUMENTS

LC-MS/MS • GC-MS/MS • GC-MS • HPLC-FLD • ICPMS

MINERALS & HEAVY METALS TESTING

Identification and quantification of essential Minerals in Human Food and Animal Feed help apportion quantities required to be consumed per day and figure out if, which and how much of assorted supplements are required to be added to the Food / Feed for making it wholesome. It also reveals the presence, if any, of harmful metals in Food and Feed enabling its segregation from the supply chain and rendering the manufacturing process safe from contamination.

EFRAC utilizes latest Equipment, validated Methods and trained technicians for Mineral detection thus assuring consummately reliable results.

PARAMETERS

Identification • Heavy Metals • Minerals Testing • Elemental Assay • Elemental Impurities • Dissolution Assay • Qualitative Test • Calcium • Magnesium • Potassium • Phosphorous • Iron • Manganese • Copper • Zinc • Sodium • Tin • Arsenic • Cobalt • Molybdenum • Chromium • Cadmium • Mercury • Nickel • Boron • Beryllium • Barium • Uranium • Thallium • Gold • Rhodium • Ruthenium • Niobium • Zirconium • Yttrium • Scandium • Selenium • Iodine • Silver • Antimony • Aluminium • Tellurium • Palladium • Platinum • Titanium • Carbon • Hydrogen • Sulfur • Nitrogen

METHODS & GUIDELINES

Indian Standard • AOAC • AOCS • ASTA • FSSAI • USP • FCC • ISO • GB

INSTRUMENTS

ICP-MS • AAS • ICP-OES • UV SPECTRO • Mercury analyzer • CHNS analyzer

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ALLERGEN SCREENING

Human Allergens come from a/in a variety of sources and forms. Most common among these are Milk (Lactose Intolerance), Eggs, Tree Nuts (Walnuts, Almonds, Pine nuts etc.), Soybean and its extracts, Wheat, Rye, Barley, Oats etc. containing Gluten, Fish, Shellfish and Molluscs etc.

Food items include Chocolates, Confectionaries and Frozen Foods.

EFRAC extends a comprehensive canvas of Allergen and Intolerance Testing Services utilizing Chemical, Enzymatic, Molecular Biologicals and Immunological Methods to test for Proteins, Lactose, DNA and Sulphites, by functionalizing optimal Testing combinations tailored to specific needs.

Immunological Testing for Allergen antibodies is common and routine. Real Time PCR or quantitative Polymerase Chain Reaction (qPCR) – a highly sensitive Molecular Biology technique with ultra-trace detection capabilities and limits in ppm range, enables Multi Allergen Testing and also of processed or heat treated Food.

EFRAC proffers extensive Allergen Screening Solutions through established expertise in standardized Allergen Analytics facilitating rigorous identification and isolation of extrinsic allergens in the Product Supply Chain Process. It also possesses critical Test Methodologies assuring diagnostic control at Input Stops.

PARAMETERS

Gluten • Peanut • Almond • Mustard • Sesame • Nut • Casein • Wheat • Fish & Shellfish • Eggs • Soybeans • Crustaceans • Celery • Sulphur dioxide and sulphites • Lupin • Molluscs

METHODS & GUIDELINES

FSSAI Manual • EU regulation number 1169/2011 • The Food Allergen Labeling and Consumer Protection Act, 2004 • AOAC • ISO • IS

INSTRUMENTS

HPLC • UV Visible Spectrophotometer • ELISA • RT-PCR

MYCOTOXIN AND ENTEROTOXIN

Mycotoxins are chemically stable toxins excreted by Food /Fruit Crop fungi. These penetrate deep into food, survive food processing and precipitate Cancers and Immune Deficiency in humans. Aflatoxin, a common Mycotoxin is Genotoxic in nature. Codex Alimentarius Commission has publicized maximum permissible levels of Mycotoxins in Human Food.

Functional Risk Management Methodologies cover monitoring, unbiased and regular sampling, testing, analysis and corrective or improvement actions to allay Food Safety concerns.

EFRAC Mycotoxin Facility is equipped for adroit sampling, dexterous testing and generating functionally coherent analytics within short TATs.

Enterotoxin is a microorganism secreted exotoxin that targets the gastrointestinal system. This causes type-A food poisoning, antibiotic associated diarrhea and other gastrointestinal diseases. Staphylococcus aureus and Bacillus cereus are the two most common organisms for enterotoxins and food poisoning in dogs and humans.

PARAMETERS

Aflatoxins (B1+B2+G1+G2) • Aflatoxins M1 • DON (Vomitoxin) • Fumonisins • ZON (Zearalenone) • Ochrtoxin • T2/HT2 • Toxin • Patulin • Ergor Alkaloids & Other Mycotoxins

METHODS & GUIDELINES

AOAC • ISO/EN • APHA • FSSAI Lab Manual

INSTRUMENTS

HPLC-PDA/FLD • LC-MS/MS • ELISA • RT-PCR

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ANTIBIOTIC AND VETERINARY DRUG RESIDUE

Antibiotic, a chemical is harnessed to counter negate Bacterial infections in Animals and Humans. Animal, Poultry and Fish farmers misuse antibiotics as a Growth Promoter and as an anti-infective without veterinary supervision resulting in gradual accumulation of parent drug residues and their metabolites in animal meat, milk and eggs. Intake leads to antibiotic resistance in Humans. Continual ingestion of antibiotics causes Nephrological, Biliary, Orthopedic and Dental disorders.

Antibiotic Residue Analysis facilitates delineation of antibiotic residues in Food. This analysis covers all key aspects such as Sampling, Analytical Method Validation and Quality Control.

Residue pharmacologically active substance in food chain meant for export is a concern of regulatory (EIC) to meet the importing country requirement. EFRAC Lab has the capability and competency to test Residue pharmacologically active substance as per EU requirement given in Commission Decision 2002/657/EC and other specific community legislation documents No. SANTE/11813/2017, Commission regulation (EC) No 333/2007and commission No 401, commission legislation no-644/2017.

PARAMETERS

Chloramphenicol • Nitrofurans • Sulfonamides • Streptomycin • Tetracycline • Oxytetracycline • Chlortetracycline • Ampicilin • Enrofloxacin • Ciprofloxacin • Erythromycin • Tylosin • Trimethoprim • Oxolinic Acid • Amino-oxazolidinone (AOZ) • Semicarbazide (SEM) • Aminohydantoin (AHD) • 3-amino5-morpholinomethyl-2-oxazolidinone (AMOZ) • 4-epi-Chlorotetracycline • 4-epi-Oxytetracycline • 4-epi-Tetracycline • Zeranol • Taleanol • Clenbuterol Hydrochloride • Salbutamol • Mabuterol • Nicarbazin • Oxalinic Acid • Amoxicillin • Doxycycline • Enrofloxacin • Difloxacin • Flubendazole • Lasalocid A • Sulfa Drugs • Sulfadimidine • Sulfadiazine • Sulfadimethoxine • Sulfadoxine • Sulfamethazine • Sulfanilamide • Sulfamerazine • Sulfamethoxypyridazine • Sulfamethiazole • Sulfathiazole • Sulfapyridine • Sulfamethoxazole • Sulfisoxazole • Sulfaquinaxaline • Diethylstilbestrol • Hexoestrol • Dienoestrol • Trenblone • 19-noetestostrone • Testosterone • Estradiol 17-B • Dimetridazole • Metronidazole • Ronidazole • Ipronidazole • Tylosin A • Neomycin B • Lasalocid • Kasugamycin • Beta Lactum • Aminoglycosides • FLQ

METHODS & GUIDELINES

FSSAI Lab Manual • AOAC • ISO/EN • EU/CODEX

INSTRUMENTS

HPLC-PDA/FLD • LC-MS/MS • ELISA

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INDUSTRIES WE SERVE

CANNED & PROCESSED FOODS

Ministry of Food Processing Industry (MoFPI), has estimated post-harvest losses in India to be US$1.5 billion (Rs 92,000 crores). Pertinently, even though, India is the second largest food producer in the world after China, less than 10 percent of the total food produced is processed into value added products. The Canned & Processed food Sector covers the entire food producing, processing, packaging, marketing and consumption chain.

Products include Cereals, Milk, Fruits, Nuts, Fish, Sea & Marine Food, Poultry, Starch, Sugar, Infant Food, Edible Oils, Herbs, Spices, Condiments, Coffee, Tobacco, Additives and Preservatives.

BAKERY & CONFECTIONARY PRODUCTS

Confections are food items rich in sugar and carbohydrates broadly divided into two broad and somewhat overlapping categories, bakers' confections and sugar confections. EFRACs offers full spectrum of testing & analytics for this product category. Clientele includes the entire value chain within this category i.e. manufacturers, packers, storage and logistics.

Testing & Analytics covers water and raw material including receipt and storage, preparation, processing, packaging, quality control, rework & control of nonconforming products, transportation, warehousing, traceability and recall. Allied facility management routines include cleaning, sanitation and maintenance, pest control and waste management system and marketing deliverables such as product information and labeling.

Products tested include Biscuits, Bread, Cake, Fondant & Cream, Fudge, Jams & Jellies Gelatin sweet, Toffee & Caramel, hard toffee & hard boiled sweet.

PARAMETERS

Moisture, Ash, Protein (N x 6.25), Fat, Total Sugars as Sucrose Acid Insoluble Ash, Acidity of Extracted Fat (Oleic acid) ,Carbohydrate, Calorie Peroxide value of extracted fat, Vitamin C, Phosphorus Reducing sugars, Artificial Food Colour, Butylated hydroxyl anisole (BHA), ter-butyl hydroquinone (TBHQ), Aspartame, Saccharine Acesulfame K, Acetic acid, Lactic acid, Citric acid, Malic acid, Tartaric acid, Potassium bromated, Benzoyl peroxide Sulphur Dioxide, Ammonium phosphate ,Calcium phosphate, Sorbic acid, Benzoic acid, Ash sulfated ,Broken biscuits, Vitamins, NOTS, MSG, Dietary Fibre, Rodent Hair, Added Colouring matter, Extraneous Vegetable Matter Mineral Oil Milk Fat Salt (as NaCl) Titrable Acidity Curcumi, Allergen, Heavy Metals, Minerals, Aflatoxin M1, Ochratoxin ,pesticide Residue Analysis.

METHOD OF ANALYSIS

FSSAI Lab Manual, AOAC, IS, ISO, APHA, AOCS, FCC

INSTRUMENTS

HPLC, GC-FID, GC-MS, LC-MS, UPLC, ICP-MS, ICP-OES, AAS, IC, ELISA

BEVERAGES (ALCOHOLIC / NON-ALCOHOLIC)

The Indian non-alcoholic beverage market is estimated to be US$ 11,800 approximately with a CAGR of about 12%. This Sector includes packaged drinking water, tea, coffee, buttermilk, yoghurt, fruit juices, extracts and concentrates, health & sport drinks and cola and non-cola drinks.

The processes used to test soft beverages present unique set of challenges including specific set of skills. Our personnel, process and automation resources enable us to drive testing and analytic solutions for both existing and products under development.

Alcoholic beverages include Beer, Brandy, Wine, Rum, Vodka, Gin, Fenny etc. Our performance driven leadership for the beverage industry is based on high quality and cost effective integrated testing & analytic services.

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PARAMETERS

Specific gravity, Carbon dioxide content, Free sulphur dioxide, Taste & aroma, Sediment & suspended matter, Reducing residual sugar, Tannins ,Appearance, Dirt and foreign matter , Carotenoids, Cyclamates, Extracts, Sucralose, Citicoline, EDTA, Glucuronolactone, Phosphorous, NOTS, Mineral & Heavy Metals, Juice, Diacetyl Content , Caffeine Content, Net weight of Content, Vitamin-A, Appearance, Colour , Aroma, Taste, Flavour , Added Sugar, Added Artificial Sweeteners, Additives, Gas Volume , Total Dissolved Solids, Limonin, Pulp - Coarse (reconstituted), Turbidity, Transmittance, Salts of Sodium & Magnesium, Fixed Acidity as Tartaric acid, Volatile acidity, Aldehydes, Methyl Alcohol, Ethyl Alcohol, Ester, Furfural, Residue on Evaporation, Added Colour, Higher Alcohols, Ash content, Sulphur dioxide, Aspartame, Saccharine, Acesulphame K , Benzoic acid, Sorbic Acid, Mono Sodium GlutamateCaramel, Phosphoric Acid, Pesticide Residue, Patulin, Melamine, Mycotoxins and Microbiological.

METHOD OF ANALYSIS

FSSAI LAB MANUAL, IS, ISO, AOAC

INSTRUMENTS

HPLC, GC-FID, GC-MS, LC-MS, UPLC, ICP-MS, ICP-OES, AAS, IC, ELISA

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FOOD DIVISION

WATER INDUSTRY

EFRAC's water testing laboratory is one of the most exhaustive and well equipped divisions with highly trained professionals and state-of-the-art instrumentation. We are catering to the analytical needs of all industries which produce or use water for one or other purposes eg. fisheries, hospitality, healthcare, agriculture, manufacturing, food and beverage processing units, etc. EFRAC also provides specialised solutions to meet the regulatory and statutory requirements of all the above industries.

TYPES OF WATER TO BE TESTED

Raw water, Potable drinking water as per IS-10500, Packaged drinking water as per IS-14543, Packaged natural mineral water as per IS-13428, Water for food processing IS-4251, Water for dialysis as per AAMI standard/IS0-13959, Water for irrigation, Water for construction as per IS-456, Water for swimming pool as per IS-3328, Water for boiler, Water as per 98/83-EU, Water as per WHO, Water as per US-EPA, Water for industrial cooling as per IS-8188, Pet bottle and container analysis as per IS-15410 and 9845, Water for basic potability, Water purifiers for efficacy test, Packaged drinking water for manufacturing companies

PARAMETERS

Physical and chemical analysis, Pesticides, Microbiological analysis, Toxic metals, Pet bottles for potability study, Pet bottles for colour migration and overall migration analysis, Efficacy of water purifier, TOC (Total Organic Carbon)

METHOD OF ANALYSIS

FSSAI Lab Manual, IS, ISO, AOAC, Codex, AOCS

INSTRUMENTS

HPLC, GC-FID, GC-MS, LC-MS, UPLC, ICP-MS, ICP-OES, AAS, IC, ELISA

FISH, SEA FOODS & PROCESSED MARINE PRODUCTS

With Fish being the most important source of lean non-vegetable protein, demand for fish, seafood and other marine products has been growing steadily with Inland aquaculture catering to a large part of the demand. Both marine and inland product catches have been the subject of intense scrutiny with respect to the safety factor.

EFRACs comprehensive testing and analytics portfolio covers DNA-based fish species determination plus all parameters for checking the quality and safety of fish and aquacultural products.

PARAMETERS

Physical Analysis (Radioactivity, water content, TVBN-total volatile basic nitrogen), Chemical Analysis (Veterinary Drug residue, PAH, Dioxins, Pesticides, histamine), Nutritional (nutrients, vitamins, trace elements, carbohydrates, protein, food additives• Allergen Analysis (Gluten), Heavy metals & Pesticide residues, Mycotoxins (Aflatoxins & Ochratoxins), Microbiological Analysis (aerobic and anaerobic bioburden, confirmation of best before dates, pathogenic Germs- EHEC, Salmonella spp., L. monocytogenes, Campylobacter, Sensory testing, Amino Acids

METHOD OF ANALYSIS

AOAC, ISO, ELISA, EU, FSSAI, Codex & US-EPA

INSTRUMENTS

HPLC, GC-FID, GC-MS, LC-MS, UPLC, ICP-MS, ICP-OES, AAS, IC, ELISA

MEAT & MEAT PRODUCTS TESTING

Meat speciation & traceability issues have been gathering eyeballs globally on account of instances of detection of frauds fraught with cultural and religious sensitivities. Recent cases of meat adulteration in India and overseas have led to stricter monitoring, stiffer penalties, suspension of export authorizations and licenses and brought the National Regulatory Frameworks of meat exporting nations under the scanner. Current Safety mechanisms for species identification, traceability and banned chemical residues are in focus.

Immunological & DNA-based qualitative PCR analytics for meat testing are in use with the latter being preferred for accuracy. EFRACs development of detailed and definitive plans termed protocols for implementation of new technologies validated through on-site trial, have helped to realize better results in terms of realisation safety and authenticity of the clients' food products.

PARAMETERS

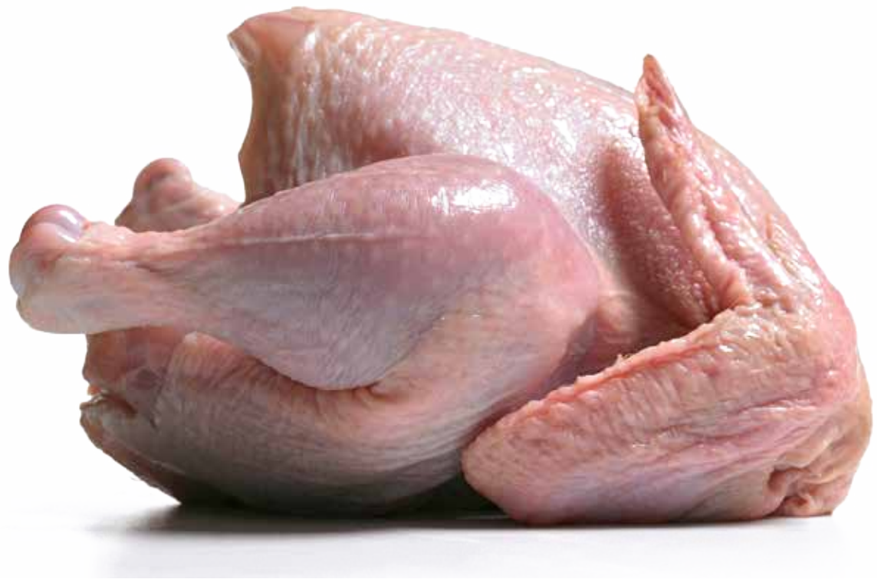
Protein, Fat, Carbohydrate, Energy, fibre, Allergen Testing, Nutritional Labelling conformance, water content, TVBN-total volatile basic nitrogen, Chemical Analysis (Veterinary Drug residue, PAH, Dioxins, Pesticides, histamine), Nutritional (nutrients, vitamins, trace elements, carbohydrates, protein, food additives, Allergen Analysis, Heavy metals & Pesticide residues, Mycotoxins (Aflatoxins & Ochratoxins).

METHOD OF ANALYSIS

FSSAI Lab Manual, IS, ISO, AOAC, DIN EN, AOCS, EU

INSTRUMENTS

HPLC, GC-FID, GC-MS, LC-MS, UPLC, ICP-MS, ICP-OES, AAS, IC, ELISA



FRUITS & FRUIT PRODUCTS

Fruit and Fruit products have assumed centrality in human nutritional profiles owing to their varied taste, fibrous content, usefulness of nutrients and minimal allergenic properties. Optimality of all these aspects combine to enhance its quality. With increasing consumer preference for prepackaged fruit products, retaining and delivering quality in fruit products safely involves definitive scientific knowledge and practice.

EFRACs experiential competency in Fruit & Fruit product Analytics makes it an informed, equipped and reliable analytics partner in arms for all Fruit producers & Fruit product manufacturers.

Varieties relate to Apricot, Plum, Fig, Raisin, Sultana, Currant, Date, Apples, Pears, Peaches, candied fruits, Goji berry and exotic fruit. Product matrix includes processed fruits, fruit juices, jam, jelly, marmalade, fruit cheese, squashes, sherbets, chutneys, pickles, standards for dried fruits and nuts.

PARAMETERS

Protein, Fat, Carbohydrate, Energy, SFA, MUFA, PUFA, TFA, Cholesterol, Vitamin A, Vitamin D, Vitamin C, Vitamin (B1+B2+B3+B5+B6+B7+B9+B12), Dietary Fibre, Synthetic color, Food Additives, Artificial Preservatives, Artificial Sugar, Sugar Profiling, Amino Acid Profiling, Artificial Sweetener, Mineral Oil, Heavy Metals, Pesticide Residue, PAHs, PCBs, MSG, pH Value, Peroxidase Activity, Melamine, Aflatoxins, NOTS

METHOD OF ANALYSIS

FSSAI Lab Manual, IS, ISO, AOAC, DIN EN

INSTRUMENTS

HPLC, GC-FID, GC-MS, LC-MS, UPLC, ICP-MS, ICP-OES, AAS, IC, ELISA

NUTS & NUT PRODUCTS

Some of nuts grown and processed may contain a variety of contaminants, harmful substances and allergens. Production, processing, transport and storage may result in contamination by pesticide, heavy metals, mycotoxin contamination or be infested by pests. Sensory analysis, assessment of product quality and class separation require extensive experience of import and export controls to ensure regulatory compliance and seamless trade operations.

Products include Nuts, kernels and processed products, e.g. flours. Almonds, Hazelnuts, Walnuts, Pistachios, Brazil nuts, Peanuts, groundnuts, Cashew, Pecan nuts, Coconuts, Composite products.

PARAMETERS

Protein, Fat, Carbohydrate, Energy, SFA, MUFA, PUFA, TFA, Cholesterol, Vitamin A, Vitamin D, Vitamin C, Vitamin (B1+B2+B3+B5+B6+B7+B9+B12), Dietary Fibre, Synthetic color, Food Additives, Artificial Preservatives, Artificial Sugar, Sugar Profiling, Amino Acid Profiling, Artificial Sweetener, Mineral Oil, Heavy Metals, Pesticide Residue, PAHs, PCBs, MSG, pH Value, Peroxidase Activity, Melamine, Aflatoxins, NOTS

METHOD OF ANALYSIS

FSSAI Lab Manual, IS, ISO, AOAC, DIN EN

INSTRUMENTS

HPLC, GC-FID, GC-MS, LC-MS, UPLC, ICP-MS, ICP-OES, AAS, IC, ELISA

MILK & DAIRY PRODUCTS

UN-FAO estimated global milk production to be 770 billion litres in 2013 constituting 10% of the total agricultural production with an average rate of growth projected to be 1.8% per year. South Asia currently accounts for 23% of the global milk production. Cows, buffaloes, goats and sheep are the major sources.

Products include Milk & Milk Powder, Cheese, Butter & Spreads, Infant Foods, ghee, paneer, Ice Cream & Desserts, Curd & Yogurt, Condensed Milk, Partly Skimmed Milk, Skimmed Condensed Milk. In view of the omnipresence across dietary profiles quality of milk in raw, semi-processed or processed forms thus assumes considerable significance for safeguarding public health. Product categories are tested for Pathogens, Adulterants, Preservatives, Pesticides, nutritional contents and additives.

EFRACs dairy testing acumen emanates from trained and skilled operatives, contemporary technology and highly sophisticated testing and analytical equipment.

PARAMETERS

Moisture, Acidity, Total Solids, SNF, RM Value, Polenske Value, Curd , Salt, Baudouin test , Phyto Sterol Test, Taurine, Inositol, L-Carnitine, Antibiotic Residue, Protein, Fat, Carbohydrate, Energy, SFA, MUFA, PUFA, TFA, Cholesterol, Vitamin A, Vitamin D, Vitamin C, Vitamin (B1+B2+B3+B5+B6+B7+B9+B12), Dietary Fibre, Synthetic color, Food Additives, Artificial Preservatives, Artificial Sugar, Sugar Profiling, Amino Acid Profiling, Artificial Sweetener, Mineral Oil, Heavy, Metals, Pesticide Residue, PAHs, PCBs, MSG, pH Value, Peroxidase Activity, Melamine, Aflatoxins, Aflatoxins M1, NOTS

METHOD OF ANALYSIS

FSSAI Lab Manual, IS, ISO, AOAC, DIN EN, ADMI, APHA

INSTRUMENTS

HPLC, GC-FID, GC-MS, LC-MS, UPLC, ICP-MS, ICP-OES, AAS, IC, ELISA

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FOOD DIVISION

STARCH & STARCH PRODUCTS

Derivatives of Starch, a polysaccharide sourced from maize, wheat and potato have multiple uses in food and and pharma industries. In food sector, its major use is as a food texturizer and stabilizer. Other uses stem from its thickening, bulking, gelling, high viscosity, enhanced water binding and retention properties. It also finds use for in extrusion and in product's shelf life extension.

Esterification, etherification, phosphorylation, pregelatinization processes are used to modify starches to overcome its inherent flaws such as freeze thaw stability, solubility, retrogradation, paste clarity etc. Types of modified starches include: Pre-gelatinized, Cross-linked, Oxidized, Cationic, Anionic, Thinned, Acetylated, Grafted, Dextrins, Starch Ethers, Physically & Enzymatically modified starches.

Digestibility of dietary starch is majorly impacted by its botanical source, food processing mechanisms and digestive and endocrine system variables. UN-FAO and WHO recommend that compositional data for dietary carbohydrates be based on chemical constituents and their nutritional properties.

PARAMETERS

Protein, Fat, Carbohydrate, Energy, SFA, MUFA, PUFA, TFA, Cholesterol, Vitamin A, Vitamin D, Vitamin C, Vitamin (B1+B2+B3+B5+B6+B7+B9+B12), Dietary Fibre, Synthetic color, Food Additives, Artificial Preservatives, Artificial Sugar, Sugar Profiling, Amino Acid Profiling, Mineral Oil, Heavy Metals, Pesticide, Residue, PAHs, PCBs, MSG, pH Value, Melamine, Aflatoxins, NOTS, Gelling power, Cold water Extract, Coking Test, Alcoholic Acidity

METHOD OF ANALYSIS

FSSAI Lab Manual, IS, ISO, AOAC, DIN EN, APHA

INSTRUMENTS

HPLC, GC-FID, GC-MS, LC-MS, UPLC, ICP-MS, ICP-OES, AAS, IC, ELISA

SUGAR & SUGAR PRODUCTS

Sugars are short-chain, soluble carbohydrates and are widely used in food. Simple sugars are called mono-saccharides and include glucose (also known as dextrose), fructose, and galactose. Both natural sugars (fruit, grain, sugarcane & sugarbeet, vegetable, milk, fruit juice) and added sugars (flavoured tea & coffee, sport drink, health drink and cola beverages, vitamin drink, smoothie, ice-cream, instant soup, flavoured yoghurt, energy bars, cereal, sauce, ketchup etc.) are ubiquitously present in the food market.

Blood sugar in excess of bodily needs & beyond its storage capacity is converted and stored as body fat leading to weight gain. Excess fat has been implicated for obesity in children and adults and in lifestyle disorder diabetes which precipitates Nephrological, Biliary & Cardiac diseases. The US Heart Association recommends that calorific contribution from added sugar should be less than half of that required. Food regulations have specific limits for added sugar in processed food with UN-WHO limiting intake of free sugars to less than 10% of total energy intake.

PARAMETERS

Reducing Sugar, Sucrose, Colour, Optical Density, Polarization, Sulphated ash, Acid Insoluble Ash, Insoluble Matter, Sulfur dioxide, Synthetic color, Food Additives, Artificial Preservatives, Artificial Sugar, Sugar Profiling , Artificial Sweetener, Mineral Oil, Heavy Metals, Pesticide Residue, PAHs, PCBs, MSG, pH Value, Peroxidase Activity, Melamine, Aflatoxins, NOTS, Allergens, Brix

METHOD OF ANALYSIS

FSSAI Lab Manual, IS, ISO, AOAC, DIN EN, APHA,ICUMSA

INSTRUMENTS

HPLC, GC-FID, GC-MS, LC-MS, UPLC, ICP-MS, ICP-OES, AAS, IC, ELISA

HERBS, SPICES AND CONDIMENTS

Spices are barks, roots, berries, seeds, dried fruits of tropical or temperate plants rich in essential oils or aromatic principles used predominantly & traditionally to flavour food and beverage. Latent potential of their inherent nutritional, anti-oxidant, anti-microbial and medicinal properties (anti-diabetic, anti-hyper cholesterolemic, anti-carcinogenic, anti-inflammatory) has led to renewed focus on this group of food items.

Current non-traditional use of spice as nutraceutical ingredients is estimated to be nearly 15% of total production in India. Nutraceutical and Life Science companies have begun tapping their healing, nutritive and health qulaities by fortifying food and as an organic medicine.

USA, Canada, Germany, Japan, Saudi Arabia, Kuwait, Bahrain, Israel and Mexico are the main importers of Indian spices. Most countries have stringent food laws and regulations to ensure imported spices are safe and wholesome for their consumers

PARAMETERS

Moisture, Total Ash (Dry Basis), Acid Insoluble Ash (Dry Basis), Water Insoluble ash (Dry Basis), Cold water soluble extract (Dry Basis), Volatile Oil (Dry Basis), Crude fibre (Dry Basis), Insect damaged matter Extraneous matter Foreign edible seeds Protein Calorie Carbohydrate Piperine, Mass / litre, Curcumin content Floral waste in saffron, Bitterness in saffron, Safranal in safron, Colouring strength in safron, Dietary Fibre, Dis colored & Weevil led fruit, Shriveled & Immature fruit, Total Nitrogen, Capsaicin, Scoville Heat Units, Alcoholic extract, Non-volatile ether extract, Starch, Cold water extract, Test for lead chromate Fineness (500um sieve), Light Berry, Extraneous matter, Sudan Dyes, Extraneous Coloring matter, Bulk Density, Granulation, Salt as NaCl, pH Value, NOTS, Methyl Mercury, Acidity, Peroxidase Test. Sulphur Dioxide, Extraneous Matter, Damaged/Discoloured Seeds, Flavour/Mustiness Mould Living or dead insects Insect fragments Rodent contamination, Added colour, Added Starch, Added Preservatives Foreign Vegetable matter, Sugar,Fat ,Melamine Monosodium Glutamate, Seed Content, Light Seeds, Allergen, Heavy metal, Mineral. Pesticides Residue. Total Aflatoxin B1, B2,G1,G2

METHOD OF ANALYSIS

FSSAI Lab Manual, IS, ISO, AOAC, DIN EN, ASTA, APHA

INSTRUMENTS

HPLC, GC-FID, GC-MS, LC-MS, UPLC, ICP-MS, ICP-OES, AAS, IC, ELISA

EDIBLE OILS & FATS

South Asian cuisine uses a large variety of edible vegetable oils, fats and spices. Middle East and South Europe also use locally grown olive oil for cooking.

Edible oil with 96% TAG, (triacylglyceride, an ester derived from glycerol and three fatty acids) additionlly contains mono - and diglycerides, phosphatides, cerebrosides, sterols, terpenes, fatty alcohols, fatty acids, fat-soluble vitamins, and other substances.

Fatty acid oxidation and subsequent interaction with amino acids and proteins results in changes in colour, texture, viscosity, density, solubility, vitamin and pro-vitamin degradation, loss of essential fatty acid, nutritional value, sensory quality and malodourous/vile compounds. As such, management of edible oil oxidation is very important in terms of its palatability, toxicity and nutritional value. Oxidative stability of edible oil depends on the raw material, the processing steps and on the storage conditions.

efrac FOOD DIVISION

PARAMETERS

Moisture, Volatile and insoluble impurity, Rancidity, Volatile matter, Fatty Acid, Cholesterol, Colour, Free Acidity, Acid Value, Iodine Value, Saponification Value, Unsaponifiable matter, Flash Point, Test for Bromide, Phosphorus, Cloud point, Bellier Turbidity Temperature, Acetyl Value, Hydroxyl Value, Optical Rotation, Specific Gravity, Titre of Fatty Acid, Melting Point (Slip Point),Aflatoxins, Conjugated Dienes & Trienes , Anisidine Value, Beta Carotene, Vitamin A, Vitamin D, Tocopherol (α+β+γ+δ) Tocotrienols (α+β+γ+δ), Squalene, Hexane, Ascorbyl (palmitate+ stearate), Propyl Gallate, Tertiary butyl hydroquinone (TBHQ), Butylated hydroxyanisole (BHA), Butylated hydroxytoluene (BHT), Dilauryl thiodipropionate, Citric acid, Sodium citrates, Monoglyceride citrate, Glyceride Profile, Polydimethylsiloxane, Soap Content, Reichert values, Polenske values, Halphen test, Erythrodiol content, Total Carotenoids, Crismer value, Baudouin test, Mineral Oil,Pestic Relative Density, Apparent Density, Refractive Index, Brassicasterol, Campesterol, Stigmasterolm, Beta-sitosterol, Delta-5-avenasterol, Delta-7-stigmastenol, Delta-7-avenasterol, Chlorophyll, SFA, MUFA, PUFA, TFA, EPA, DHA, Omega-3, Omega-6, Omega-9, Pesticide Residue, Heavy Metals, Polar compounds, Bleachability Index, DMSO, Allyl iso-thocyanate, Lecithin, Melamine, synthetic colour

METHOD OF ANALYSIS

FSSAI Lab Manual, IS, ISO, AOAC, AOCS, DIN EN, CODEX

INSTRUMENTS

HPLC, GC-FID, LC-MS/MS, GC-MS/MS, UPLC-PDA/FLD, ICPMS, ICPOES, AAS-FLAM/GTA/VGA, FTIR, KF, DSC, IC, ELISA

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FOOD DIVISION

INFANT FOOD

Indian Regulator FSSAI, defines "Infant Food" as a product prepared by spray drying of the milk of cow or buffalo or a mixture thereof. Product modification may be effected by partial removal /substitution of different milk solids, carbohydrates such as sucrose, dextrose and dextrin / malto-dextrin, maltose and lactose, salts like phosphates and citrates, vitamins A, C, D, E, B or others and minerals like iron, copper, zinc and iodine.

Safety of food meant for babies and young children is critical on account of their low body weight and increased sensitivity. Limits applicable to toxic residues in infant food are significantly lower than those for adults. Heavy Metal contaminants and mycotoxin levels may fluctuate and are difficult to regulate.

PARAMETERS

Moisture, Milk Protein & Fat, Total & Insoluble Ash, Heavy Metal Analysis, Solubility Index, Vitamins- A,C, D, K, B 12, Thiamine, Niacin, Riboflavin, Pyridoxine, Pantothenic & Folic Acid, Biotin, Sodium, Potassium, Calcium, Magnesium, Phosphorous, Iron, Iodine, Copper, Zinc, Manganese, Selenium & Chloride, Total dietery fibre, Cholesterol, Fatty acids, Melamine, Aminoacid profile, Carotenoid, Flourine, Carnitine, Lysozyme, Antioxidant, Artificial Sweetner, Artiifical Colour, Taurine, Zearalenone, Neucleotides

METHOD OF ANALYSIS

FSSAI Lab Manual, IS, ISO, AOAC, DIN EN, APHA, AOCS

INSTRUMENTS

HPLC, GC-FID, GC-MS, LC-MS, UPLC, ICP-MS, ICP-OES, AAS, IC, ELISA

CEREALS & CEREAL PRODUCTS

Rice & Wheat are Cereal staples for humans and livestock feed in most countries and also constitute raw material for many of our foods and certain beverages. Others are rye, oats, barley, maize, triticale, millet, sorghum and soybean (though it is a legume). Cereals contain carbohydrate, protein, fiber and micronutrients- Vitamins E & B, Magnesium and Zinc. Milling and like processes yield wheat, rye, and oat flours and semolina, cornmeal, corn grits used to prepare breakfast cereals, pasta, snack foods, dry mixes, cakes, pastries, tortillas and as batters and coatings, thickeners and sweeteners, processed meats, infant foods, confectionary products, and beverages such as beer.

Contamination of Cereals by rodent hair and excreta,bolting and dressing the said wheat meal on account of humidity, temperature, sunlight, frost, soil conditions, wind, insect, bird and rodent activity, harvesting equipment, use of pesticides and during storage and handling.

PARAMETERS

Moisture, Ash, fat, Protein, Gluten, Acid insoluble ash, Alcoholic Acidity, SFA, MUFA, PUFA & TFA, Chalky, L/ B Ratio, Glutinous kernels, Rancid Taste, Ergot, Uric acid, Acid value of extracted fat, Carbohydrates, Crude fiber, Energy, Amino acid, Sugar Profile, NOTS, BOAA, DON, Amylose content, Kesari Dal, Benzoyl peroxide, Potassium Bromate, Hexane, Oxalic Acid , Available lysine Gossypol, Ascorbic Acid,, Allergen Analysis, Heavy metals & Pesticide residues, PAHs, PCBs, Aflatoxins, Ochratoxin, Monosodium Glutamate, Melamine, Chlorine , Alpha Amylase , Diacetyltartaric& Fatty acid ester of Glycerol , Potassium Iodate , Ascorbyl ester, Beta Cyclodextrin, Benzoic acid & its salts , Sorbic acid and its salts, Polydimethylsiloxane, Microbiological Analysis

METHOD OF ANALYSIS

FSSAI Lab Manual, IS, ISO, AOAC, Codex, AOCS

INSTRUMENTS

HPLC, GC-FID, GC-MS, LC-MS, UPLC, ICP-MS, ICP-OES, AAS, IC, ELISA

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FOOD DIVISION

COFFEE & COCOA PRODUCTS

Coffee

Coffee belongs to the plant genus Coffee. The two main varieties are Coffee Arabica and the qualitatively superior Coffee Robusta. Coffee for brewing comes from processing and roasting seeds from the coffee cherry fruit. Over 2 billion cups of coffee are presumed to have been consumed in India in 2018.

Cocoa

Cocoa beans, the main ingredient for production of chocolates and related products is sourced from the "fine or flavour" (Criollo or Trinitario) variety or the "bulk" or "ordinary" (Forastero) variety.

Quality assessments are based on the genetic origin of planting material, morphological characteristics of the plant, chemical, flavour and color characteristics of the cocoa beans and nibs produced, degree of fermentation, drying,
acidity, off-flavours, percentage of internal mold, insect infestation and percentage of impurities. USA alone is estimated to consume 1270 million kg of chocolates every year.

PARAMETERS

Moisture, Caffeine, Total Ash, Water & Acid Insoluble Ash, Solubility, Alkalinity of Soluble Ash, Ochratoxin-A,SFA, MUFA, PUFA & TFA, Rancid Taste, Carbohydrates, Crude fiber, Energy, Amino acid, Sugar Profile, NOTS, Oxalic Acid , Allergen Analysis, Pesticide residues, PAHs, PCBs, Benzoic acid & its salts , Sorbic acid and its salts, Allergens, Contaminants, Filth & Extraneous Matter, Calories, Dietery fibre , Fatty acids Profiling, Heavy metal, Melamine, Aflatoxins, Total Sugar, Artificial Sweetner.

METHOD OF ANALYSIS

FSSAI Lab Manual, IS, ISO, AOAC, DIN EN, APHA

INSTRUMENTS

HPLC, GC-FID, GC-MS, LC-MS, UPLC, ICP-MS, ICP-OES, AAS, IC, ELISA

TOBACCO & TOBACCO PRODUCTS

Addictive chemical - nicotine, is a product of the tobacco plant - Nicotiana tabacum, a herbaceous member of the Solanaceae family. Nicotine is the main ingredient in cigarettes, e-cigarettes and nicotine-replacement products (gum, patch). Inhalation or ingestion leads to absorption in blood. Use or exposure to tobacco smoke increases nicotine and cotinine concentrations in the body. In large amounts, nicotine can be poisonous.

Liver metabolizes Nicotine into more than 20 compounds, which are excreted through urine. Long-term use of tobacco & its products increases the risk of developing various cancers, cardiac diseases, respiratory infections, worsens asthma and impairs fetal growth and leads to low birth weight babies.

Testing is used for evaluating conformance to national and international regulations, in smoking cessation programs, prospective employment assessments, and evaluation of applicants' health for medical or life insurance.

PARAMETERS

Moisture, Ash, Acid Insoluble Ash, PAHs, PCBs, Filling Value, Shatterability, Strip Yield, Elasticity, Texture or Porosity, Hygroscopicity, Combustibility, Total Nitrogen Count, Nicotine Content, Nitrogen / Nicotine Ratio, Reducing Sugars, Reducing Sugars / Nicotine Ratio, Carbohydrate / Protein Ratio, Potassium, Chlorides

METHOD OF ANALYSIS

FSSAI Lab Manual, IS, ISO, AOAC, DIN EN, APHA

INSTRUMENTS

HPLC, GC-FID, GC-MS, LC-MS, UPLC, ICP-MS, ICP-OES, AAS, IC, ELISA

efrac
FOOD DIVISION

EDIBLE SALTS

Salt or Sodium Chloride majorly sourced from sea, is an important ingredient in cuisines worldwide. Increasing marine pollution has led to intense focus on the quality of salt extracted from sea. Salt Testing Service in India also focuses on additives like iodine compounds added to fortify salt and counter iodine deficiency in certain sections of Indian population.

PARAMETERS

Moisture, Water insoluble matter, Chloride content (as NaCl), Matter soluble in water other than sodium chloride, Calcium, Magnesium, Sulphate, Iodine content, Alkalinity , Lead, Arsenic, Cadmium, Chromium, Mercury, Iron, Copper , Melamine, Aflatoxins, NOTS.

METHOD OF ANALYSIS

FSSAI Lab Manual, IS, ISO, AOAC, DIN EN, APHA

INSTRUMENTS

HPLC, GC-FID, GC-MS, LC-MS, UPLC, ICP-MS, ICP-OES, AAS, IC, ELISA

ANIMAL NUTRITION SUPPLEMETNS

Animals are farmed for milk, meat, hides etc. The need to ensure health of animals along with their proper growth and development has necessitated formulation and availability nutritious animal food & feed conforming to Regulatory Standards. According to FAO, Feeds are complex materials with specific physical and chemical characteristics that affect the results of the animal nutrition process.

Compared to easily digestible feeds, those with low energy value pass slowly through the animal digestive to reducing its appetite. Reduced feed intake and slow release of digestible energy reduces weight gain, milk production and/or work output of the animal. Thus shortages of good quality feed can be offset by serving better quality feed to animals particularly to weaned calves, pregnant and lactating milch animals.

PARAMETERS

Moisture, Total ash, Acid insoluble ash, Crude, Protein, True protein, Non-protein nitrogen, Crude Fat, Salt, Energy, Metabolizable energy, Calcium, Phosphorus, Pepsin digestibility index, Vitamin Analysis, Amino Acid Analysis, Minerals, Heavy Metals, Aflatoxins

METHOD OF ANALYSIS

IS, ISO, AOAC, APHA, FCC, FSSAI Lab Manual

INSTRUMENTS

HPLC, GC-FID, GC-MS, LC-MS, UPLC, ICP-MS, ICP-OES, AAS, IC, ELISA

ESSENTIAL NUTRIENTS INCLUDING VITAMINS

Naturally present or nutrient additions in food for effecting fortification are critical within framework of the national Preventive Public Health Assurance Policy. Consumption of nutritious, wholesome and safe food goes a long way in making preventive health measures, a reality. This factor mandates retention of natural nutrients, proteins and vitamins plus qualified nutrient additives to make up vital nutritional deficiencies in certain types of food and also ensure stability for a reasonable time period.

PARAMETERS

Vitamin Analysis - A, B1, B2, B6, B12, C, D3, E Mycotoxin Analysis - Ochratoxin A, Aflatoxin B1, B2, G1, G2 & M1, Sugar Analysis (Fructose, Glucose, Sucrose & Maltose, Heavy Metal Analysis, Trace Element Analysis , Preservative Analysis – Sorbic, Benzoic, Propionic, Dehydroacetic Acids, Potassium Sorbate, Sodium Benzoate, Propionate & Natamycin, Sweetening Agent Analysis – Acesulfame, Aspartame, Cyclamate, Saccharin Sodium, Synthetic Pigment Analysis – Carmine, Amaranth, Lemon & Sunset Yellow, Brilliant Blue, Allura Red, Erythrosine, Antioxidant Analysis- Beta Hydroxy Acid, Butylated Hydroxytoluene, Tertiary butylhydroquinone, Propyl Gallate

METHOD OF ANALYSIS

FSSAI Lab Manual, IS, ISO, AOAC, DIN EN, APHA

INSTRUMENTS

HPLC, GC-FID, GC-MS, LC-MS, UPLC, ICP-MS, ICP-OES, AAS, IC, ELISA

GELATIN AND OTHER GUMS

Processed foods have come to be associated with a certain quality and eating experience in terms of consistency in texture, taste and mouth feel. Addition of stabilizers (SB), thickeners (TN) and gelling agents (GA) are few of the tools used by the food industry. Cosmetics and Pharmaceutical industries use gelling agents to create necessary textural properties.

Gels find frequent use as a binding agent, whipping agent, TN, SB, and adhesive, amongst others. These ingredients, extracted primarily, from natural substances, are approved for use as direct additives in food products to provide structure, viscosity, stability or for maintaining existing colour.
SB, TN & GA though classified separately, overlap in functionality. When dissolved or added to foods, they create stiffness, stabilize emulsions or form gels.

Gelling agents also function as stabilizers and thickeners to provide thickening without stiffness through the formation of gel in jellies, jams, desserts, yogurts and candies. Gums, starches, pectin, agar-agar and gelatin are common gelling agents. GA are largely polysaccharides (starches: arrowroot, cornstarch, potato starch, sago, tapioca), (vegetable gums: guar gum, xanthan gum and locust bean gum) or Pectin (apples or citrus fruit).

Protein sources include collagen, egg whites, gelatin (animal collagen) and whey. Sugars- agar (algae), carrageenan (seaweeds), Sodium pyrophosphate, Lecithin (egg yolk, legumes and corn) and Mono & di-glycerides (seed oils) constitute the other sources.

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PARAMETERS

Identification Test, Test for Gelatin Liquefaction, Moisture, Ash,Nitrogen, Acid insoluble ash, Rancid Taste, Ergot, Crude fiber, Allergen Analysis, Heavy metals & Pesticide residues, PAHs, PCBs, Aflatoxins, Melamine, Beta Cyclodextrin, Benzoic acid & its salts , Sorbic acid and its salts, Microbiological Analysis

METHOD OF ANALYSIS

ISO, FDA-BAM, AOAC, GME, FSSAI

INSTRUMENTS

HPLC, GC-FID, GC-MS, LC-MS, UPLC, ICP-MS, ICP-OES, AAS, IC, ELISA

NUTRACEUTICALS AND FUNCTIONAL FOODS

Beginning with fortification of salt with iodine to prevent goitre in USA in early 1900's, the "Nutraceutical" or "Functional Food" segment, is now one of the fastest growing product categories within the global food industry. Manufacturers have been cashing on by developing and integrating functionality into their products and marketing many as panacea for expanding Consumer Health & Wellness concerns.

Nutraceuticals are natural, bioactive chemical entities with health promoting, disease preventing or with general medicinal properties. Functional Foods, a sub-segment within Nutraceuticals are those that claim specific health benefits from specific ingredients. Nutraceuticals are generally grouped into three Food Categories:

- Fortified with specific nutrients to prevent deficiency-based diseases

- Containing microorganisms or substances for promoting intestinal microorganisms

- Containing bioactive components or enzymes including those enhanced by special feeding or Genetic Engineering

PARAMETERS

Total Polyphenols, Total Procyanidins, Total Bioflavonoids, Carotenoids, Phenolic Acids, Catechins, Organic Acids, Flavonoids, Isoflavones, Nucleosides and Nucleotides, Sterols, Amino acids, Fatty Acids including Omega Fatty Acids, Vitamins, Nutritional Panel, Moisture,Total Ash, AIA, Fat, Protein,-Carbohydrate, Sugar Profile, Allergen, Aflatoxins

METHOD OF ANALYSIS

FSSAI Lab Manual, IS, ISO, AOAC, DIN EN, APHA

INSTRUMENTS

HPLC, GC-FID, GC-MS, LC-MS, UPLC, ICP-MS, ICP-OES, AAS, IC, ELISA

NATURAL WAXES

Natural waxes, a mix of esters, alcohols and fatty acids are stronger, less fatty than oils and fats, but resist oxidation and are less affected by moisture and microbes. Its emollient and protective qualities are utilized in congealing formulations, in boosting viscosity and consistency and in imparting stability to cosmetics.

Natural waxes may be of Animal / Insect origin – Bee, Lanolin, Shellac or of Vegetable origin- Candelilla Wax, Carnauba Wax, Castor Wax or even of Mineral or Petroleum origin – Petroleum, Ceresin. In India, Food Regulator, FSSAI permits use of Beeswax, Candelilla Wax and Carnauba Wax for food applications.

Efracs tests' for purity and quality of natural waxes for food and cosmetic manufacturers enable them to conform to requirements laid down by the USDA NOP (National Organic Program) for "Organic Label" Claims.

PARAMETERS

Acid Value / Acid Number, Appearance, Benzene Solubility, Colour, Congealing Point, Drop Point, Ester Value, Ester Number, Flash Point, Insoluble Impurities, Iodine Value / Iodine Number, Melting Point, Melting Range, Needle Penetration, Oil Content, Paraffinic Hydrocarbons, Peroxide Value/ Peroxide Number, Ratio Number, Refractive Index, Resinous Matter, Saponification Cloud Point, Saponification Value / Saponification Number, Specific Gravity, Unsaponifiable Matter, Viscosity, Volatile Matter (including Moisture)

METHOD OF ANALYSIS

FSSAI, ISO, ASTM, AOAC, BP, USP

INSTRUMENTS

HPLC, GC-FID, GC-MS, LC-MS, UPLC, ICP-MS, ICP-OES, AAS, IC, ELISA

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HONEY & HONEY PRODUCTS

Nectar, a sugary liquid, is extracted from flowers by bees, partially digested and dehydrated & then deposited into a honeycomb. Honey's color, taste, aroma and texture vary greatly depending on the type of flower a bee frequents.

Honey is extensively used by the Food processing industry as an add-on to different confections. It is also an important ingredient in Ayush formulations. Adulteration and false declarations regarding its botanical or geographical origin is common. Authenticity & traceability factors are thus both crucial for both producers and consumers.

PARAMETERS

Moisture, Acidity, Total Reducing Sugars, Sucrose, Fructose / Glucose Ratio, Specific Gravity, Fiehes Test, Aniline Chloride Test, HMF, Ash, Acid insoluble Ash, Invert Sugar, Colour, Refractive Index, Foreign Matter, Chloramphenicol, Nitrofurans, Streptomycin, Tetracycline, Sulfonamides, Organochlorine Compounds: Chlorbenzilate, Hexachlorobenzene, p, p DDT, o, p, DDT, p, p DDE, p, p, DDD, α-HCH, β- HCH, γ-HCH, Vinclozolin, Allergen, NOTS, Heavy metal, Mealmine, Diastase activity, Artificial Sugar, C3 & C4, Pollen Count , Sugar Profile, Preservatives, Artificial Sweetener.

METHOD OF ANALYSIS

IS, AOAC, ISO, FSSAI Lab Manual

INSTRUMENTS

HPLC, GC-FID, GC-MS, LC-MS, UPLC, ICP-MS, ICP-OES, AAS, IC, ELISA

TEA & TEA PRODUCTS

Tea, the 2nd largest consumed beverage after water is produced majorly in India. Variety of Tea produced depends on the processing method employed. Tea has a highly complex chemical composition comprising diverse polyphenols, purine alkaloids, polysaccharides, amino acids, vitamins, lipids, and volatiles with the dominant polyphenols being catechins in green tea and theaflavins and its polymers thearubigins in black tea.

This complex combination of chemicals makes tea testing and analysis a potent task where techniques such 2D-LC are required for precision in results.

PARAMETERS

Artificial Colour, Total Soluble Solids (Water Extract), Total Liquor Colour (TLC), High Polymerized Substances (HPS), Theaflavins (TF), Thearubigins (TR), Total Ash, Water Soluble Ash, Water of Total Ash, Alkalinity of Water Soluble Ash (K2O), Acid Insoluble Ash, Crude Fibre, Heavy Metals (mg/kg), Iron Filings, Mycotoxin, Pesticide, Insecticide & Fungicide (Dicofol/Ethion/Quinolfos), E. coli, Staph. Aureus, Caffeine, Total Catechine, Polyphenols, Vitamins, Added Colour, Artificial sweetner, Sulphur, Fluoride, NOTS, Total Sugar, Total dietery fibre, Allergen, Aflatoxins, Fatty acids

METHOD OF ANALYSIS

AOAC, IS, ISO, AOCS, FSSAI,GB

INSTRUMENTS

HPLC, GC-FID, GC-MS, LC-MS, UPLC, ICP-MS, ICP-OES, AAS, IC, ELISA

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OIL SEEDS & BY-PRODUCTS

India's domestic consumption of oilseeds is catered to, by domestic production and imports. Soybean, Groundnut, Rapeseed & Mustard are major sources of edible oil with Peanut, Sunflower & Copra being the others. Uncrushed oilseeds have large concentration of Energy and moderate concentration of Protein & Fibre. Oilmeals are thus a major energy source in diets of lactating dairy cows.

Oil extraction technology influences the consequent nutrient content in meals. Moreover, ruminal microorganisms greatly degrade Oilseed and Oilmeal Protein. To obviate this problem, they are treated to ensure reduction in degradability prior to their usage as animal feed. Testing and Analyzing various parameters applicable to edible oil quality is extremely important in order to ensure their conformance with established standards and address public health concerns.

PARAMETERS

Moisture, Volatile and insoluble impurity, Rancidity, Volatile matter, Fatty Acid, Cholesterol, Colour, Free Acidity, Acid Value, Iodine Value, Saponification Value, Unsaponifiable matter, Flash Point, Test for Bromide, Phosphorus, Cloud point, Bellier Turbidity Temperature, Acetyl Value, Hydroxyl Value, Optical Rotation, Specific Gravity, Titre of Fatty Acid, Melting Point (Slip Point),Aflatoxins, Conjugated Dienes & Trienes , Anisidine Value, Beta Carotene, Vitamin A, Vitamin D, Tocopherol (α+β+γ+δ) Tocotrienols (α+β+γ+δ), Squalene, Hexane, Ascorbyl (palmitate+ stearate), Propyl Gallate, Tertiary butyl hydroquinone (TBHQ), Butylated hydroxyanisole (BHA), Butylated hydroxytoluene (BHT), Dilauryl thiodipropionate, Citric acid, Sodium citrates, Monoglyceride citrate, Glyceride Profile, Polydimethylsiloxane, Soap Content, Reichert values, Polenske values, Halphen test, Erythrodiol content, Total Carotenoids, Crismer value, Baudouin test, Mineral Oil,Pestic Relative Density, Apparent Density, Refractive Index, Brassicasterol, Campesterol, Stigmasterolm, Beta-sitosterol, Delta-5-avenasterol, Delta-7-stigmastenol, Delta-7-avenasterol, Chlorophyll, SFA, MUFA, PUFA, TFA, EPA, DHA, Omega-3, Omega-6, Omega-9, Pesticide Residue, Heavy Metals, Polar compounds, Bleachability Index, Dioxin & Furan, 3-MCPD, PAHs, PCBs

METHOD OF ANALYSIS

IS, ISO, FSSAI, AOAC, AOCS

INSTRUMENTS

HPLC, GC-FID, LC-MS/MS, GC-MS/MS, UPLC-PDA/FLD, ICPMS, ICPOES, AAS-FLAM/GTA/VGA, FTIR, KF, DSC, IC, ELISA

EGGS & EGG PRODUCTS

Eggs are loaded with high-quality proteins, vitamins, minerals, riboflavin and selenium good fats and various trace nutrients. the majority of an egg's nutrient package is found in the yolk.

EFRAC tests for nutritional and proximate parameters and also for residues of antibiotics, growth promoters and other drug residue in eggs, feed and livestock. These include compounds banned from use in livestock production. EFRAC is also doing the analysis of all the parameters as per EIC (Export Inspection Council) RMP for egg products, poultry meat and poultry meat products for the current year.

PARAMETERS

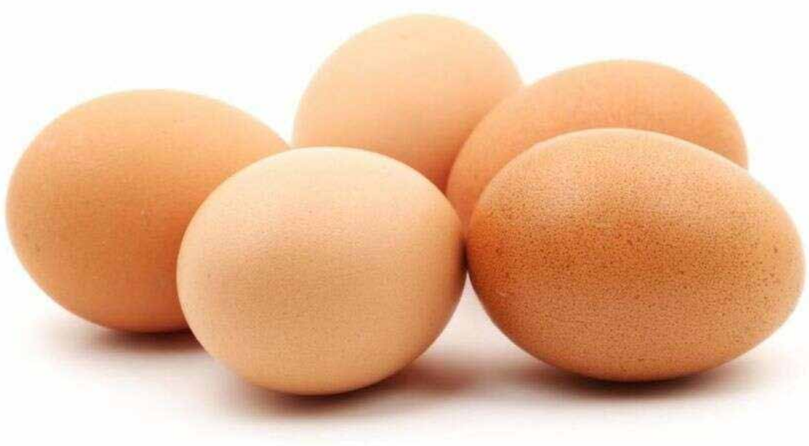
Moisture content, Protein Lecithin and fat, Solubility, Orric acid, Organic phosphorous, Ash, Ash insoluble in hydrochloric acid, Oxygen content, Beta Carotene, Vitamin A, Vitamin D, Vitamin E and Vitamin B, Allergen, Heavy Metals, Melamine, Aflatoxins,Carbohydrate, Energy, Phosphorous, Calcium, Magnesium, Acidity, Dioxin & Furan, Antibiotic & veterinary drug and Hormone, Pesticide Residue, PAHs, PCBs.

METHOD OF ANALYSIS

IS, ISO, FSSAI, AOAC, AOCS

INSTRUMENTS

HPLC, GC-FID, GC-MS, LC-MS, UPLC, ICP-MS, ICP-OES, AAS, IC, ELISA



SHELF LIFE OF FOOD

Stability or self life testing assesses how the quality of a product (including its packaging) varies with time under the influence of environmental factors, including temperature, humidity and light. The process determines whether any physical, chemical or microbiological changes affect the efficiency and integrity of the final product, thereby ensuring that a product is safe and effective, irrespective of where in the world it will be supplied. Moreover, stability testing establishes the shelf life and recommended storage conditions of finished product. Some harmful microorganisms are able to grow to unaccept-able levels or even produce dangerous toxins with or without necessarily having a deleterious effect on the organoleptic quality (smell, taste, texture) of the product.

STABILITY CRITERIA AND VARIABLES

MICROBIOLOGICAL CRITERIA

Microbiological tests are needed to track spoilage of products. To determine the effect of shelf life from a microbiological standpoint, there are several aspects that have to be considered. One must determine if the product will support microbiological activity. If the product does support growth, it is important to determine if this growth would result in product spoilage or present potential consumer safety issues. To answer these questions, there are several factors that have to be determined. These factors are: pH, water activity, how the product will be distributed and retailed, length of shelf life, preservatives used.

CHEMICAL CRITERIA

- Do any active ingredients or components of the Product degrade over time in a manner which adversely affects the product?
- Is there interaction between the product and package that has undesirable affects?
- Do any of the manufacturing processes alter the chemistry of the raw materials, components, or finished product in a manner which adversely affects product Safety or performance?

PHYSICAL CRITERIA

- Do the storage conditions, e.g., temperature, humidity, light, etc., have an effect on the product in a manner which adversely affects product safety or performance?

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MICROBIOLOGICAL SERVICES

ALCOHOLIC/NON ALCOHOLIC DRINKS & BEVERAGES (CARBONATED/NON-CARBONATED)

Alcoholic & Non-alcoholic beverages play a very important role in the dietary pattern of people in developing countries. They are regarded as after meal drinks or refreshing drinks. Most of these beverages are made up of about water, alcohol, sugar, flavouring agents and sometimes preservatives. These beverages are, however, highly prone to microbial deterioration if not adequately stored. A large number of bacteria and fungi cause spoilage as they can use the carbohydrate content for fermentation processes producing undesirable changes in them. The products of fermentation like acids, alcohols, diacetyls affect the organoleptic properties of foods.

PARAMETERS

Total Plate Count, Coliform counts, Yeast & Mold count, Detection and Enumeration of Staphylococcus aureus, Faecal Streptococcal count, Detection and Enumeration of E. coli, Enumeration of Pseudomonas sp., Detection of Salmonella sp, Detection of Shigella sp, Detection of Clostridium perfringens, Detection of Vibrio cholerae and V. parahaemolyticus.

METHOD OF ANALYSIS

IS, ISO, BAM, APHA

INSTRUMENTS

Autoclave, Laminar Air Flow, Biosafety Cabinet, Incubator, CO2 incubator, Hot Air Oven, Microscope,RT-PCR, ELISA

BAKERY AND CONFECTIONERY PRODUCTS

Bakery products are an important part of a balanced diet and a wide variety of such products can be found on markets. Apart from physical & chemical changes, bakery products are susceptible to microbiological spoilage by bacteria, yeast and molds. Handling of post baking samples can quickly lead to fungal, microbial surface contamination as a result of exposure to airborne contaminants as well as equipment contact.

PARAMETERS

Total Plate Count, Coliform counts, Yeast & Mold count, Detection and Enumeration of Staphylococcus aureus, Detection of Salmonella sp, Detection and Enumeration of E.coli, Detection of Shigella sp, Detection of Listeria sp, Detection of Clostridium perfringens, Detection of Vibrio cholerae and V. parahaemolyticus.

METHOD OF ANALYSIS

IS, ISO, BAM, APHA

INSTRUMENTS

Autoclave, Laminar Air Flow, Biosafety Cabinet, Incubator, CO2 incubator, Hot Air Oven, Microscope, RT-PCR, ELISA

MILK & DAIRY PRODUCTS

Milk is virtually sterile when it is synthesized in a healthy cow's udder. Milk may become contaminated with bacteria during or after milking. Milk contains important nutritional components for microbial growth. The bacteria present in dairy products may cause disease or spoilage. Human illness from milk-borne pathogens is usually associated with consumption of raw milk or products made from milk.

PARAMETERS

Acidophilic Count , Thermophillic Flat Sour Spore Formers , Aciduric Flat Spore Formers , Aerobic Plate Count , B. Cereus, Clostridium botulinum , Clostridium perfringens , Coliform Count , Commercial Sterility (BAM canned food analysis), E.coli 0157:H7 , Fecal Coliform , Lactobacilli , Mesophilic anaerobic spore formers , Mesophilic aerobic spore formers , Microbial Challenge Tests , Proteolytic Counts , Pseudomonas, Psychotropic Plate Count, Rope Spore Count, Salmonella, Staphylococci, Sulfide Spoilage Organisms, Thermoduric Bacteria , Thermophillic Bacteria Yeast & Mold Count , Yersinia enterocolitica , Listeria monocytogens.

METHOD OF ANALYSIS

IS, ISO, BAM, APHA

INSTRUMENTS

Autoclave, Laminar Air Flow, Biosafety Cabinet, Incubator, CO2 incubator, Hot Air Oven, Microscope, RT-PCR, ELISA

CANNED & PROCESSED FOODS

Thermally processed meat and poultry products in hermetically sealed containers include both shelf stable products as well as those that kept under refrigeration are tested here with the identification of different pathogens responsible for the spoilage of the products.

PARAMETERS

Total Plate Count, Coliform counts, Yeast & Mold count, Detection and Enumeration of Staphylococcus aureus, Detection & Enumeration of Bacillus cereus, Detection and Enumeration of E.coli, Incubation Test @ 37°C for 10 days, Incubation Test @ 37°C for 7 days, Heat resistant molds (HRM), Flat sour spore count, Detection of Listeria sp, Detection of Salmonella sp, Detection of Shigella sp, Detection of Clostridium perfringens, Detection of Vibrio cholerae and V.parahaemolyticus.

METHOD OF ANALYSIS

IS, ISO, BAM, APHA

INSTRUMENTS

Autoclave, Laminar Air Flow, Biosafety Cabinet, Incubator, CO2 incubator, Hot Air Oven, Microscope, RT-PCR, ELISA

CEREALS, PULSES & CEREAL PRODUCTS

Cereals, pulses & cereal products are food staples in most countries. Because of their extensive use as human foods and livestock feeds, the microbiology and safety of cereals and cereal products is very important. Microorganisms that contaminate cereals and pulses may come from air, dust, soil, water, insects, rodents, birds, animals, humans, storage and shipping containers, and handling and processing equipment.

PARAMETERS

Total Plate Count, Coliform counts, Yeast & Mold count, Detection and Enumeration of Staphylococcus aureus, Faecal Streptococci count, Detection and Enumeration of E.coli, Enumeration of Pseudomonas sp., Detection of Salmonella sp, Detection of Shigella sp, Detection of Clostridium perfringens, Detection of Vibrio cholerae and V. parahaemolyticus.

METHOD OF ANALYSIS

IS, ISO, BAM, APHA

INSTRUMENTS

Autoclave, Laminar Air Flow, Biosafety Cabinet, Incubator, CO2 incubator, Hot Air Oven, Microscope, RT-PCR, ELISA

COOKED FOOD

Ready to eat food is defined as food that can be consumed directly without further preparation or treatment. RTE food can be of animal and plant origin. Since RTE foods are consumed without additional treatment, a risk of foodborne disease outbreaks linked to the consumption of RTE food are high if the food was improperly handled.

PARAMETERS

Total Plate Count, Coliform counts, Yeast & Mold count, Detection and Enumeration of Staphylococcus aureus, Faecal Streptococci count, Detection and Enumeration of E. coli, Enumeration of Pseudomonas sp., Detection of Salmonella sp, Detection of Shigella sp, Detection of Clostridium perfringens, Detection of Vibrio cholerae and V.parahaemolyticus.

METHOD OF ANALYSIS

IS, ISO, BAM, APHA

INSTRUMENTS

Autoclave, Laminar Air Flow, Biosafety Cabinet, Incubator, CO2 incubator, Hot Air Oven, Microscope, RT-PCR, ELISA

HERBS, SPICES & CONDIMENTS

Spices constitute an important group of agricultural commodities. The spices are produced from roots, barks, leaves, bulbs, stems, flowers and seeds of certain plants. Contamination by microorganisms can occur when spices are dried in the sun. While drying, plants are accessible to insects, reptiles and other animals.

PARAMETERS

The following parameters can be tested in our lab for various spices which includes Total Plate Count, Coliform counts, Yeast & Mold count, Detection and Enumeration of Staphylococcus aureus, Faecal Streptococci count, Detection and Enumeration of E. coli, Enumeration of Pseudomonas sp., Detection of Salmonella sp, Detection of Shigella sp, Detection of Clostridium perfringens, Detection of Vibrio cholerae and V. parahaemolyticus.

METHOD OF ANALYSIS

IS, ISO, BAM, APHA

INSTRUMENTS

Autoclave, Laminar Air Flow, Biosafety Cabinet, Incubator, CO2 incubator, Hot Air Oven, Microscope, RT-PCR, ELISA

TEA, COFFEE & COCOA PRODUCTS

Drinking tea and coffee constitutes a tradition which is deeply rooted in the culture of several countries. Moreover, in recent years, tea & coffee consumption is growing all over the world. Improper storage (long periods, humid environments) represents a relevant health hazard for consumers because of the growth of bacteria and molds.

PARAMETERS

Total Plate Count, Coliform counts, Yeast & Mold count, Detection and Enumeration of Staphylococcus aureus, Faecal Streptococcal count, Detection and Enumeration of E. coli, Enumeration of Pseudomonas sp., Detection of Salmonella sp, Detection of Shigella sp.

METHOD OF ANALYSIS

IS, ISO, BAM, APHA

INSTRUMENTS

Autoclave, Laminar Air Flow, Biosafety Cabinet, Incubator, CO2 incubator, Hot Air Oven, Microscope, RT-PCR, ELISA

WATER

PARAMETERS

Drinking Water as per IS: 10500-1991

Parameters includes Total Coliform, Fecal coliform, E. coli, MS2 phage, Enterovirus, Hepatitis A Virus, Planktons

Packaged Drinking Water as per IS 14543

Parameters included Total Aerobic Count at 37°C and 22°C, Yeast & Mold, Coliform, E. coli, Staphylococcus aureus, Salmonella sp., Shigella sp., Fecal Streptococci, Sulphite reducing anaerobes (Clostridia), Pseudomonas sp., Vibrio cholerae, V. parahaemolyticus.

Water for Fermentation Industry as per IS 4700-1968 RA 1999

Parameters include Standard Plate Count and Proteolytic bacterial count

METHOD OF ANALYSIS

IS, ISO, USEPA

INSTRUMENTS

Autoclave, Laminar Air Flow, Biosafety Cabinet, Incubator, CO2 incubator, Hot Air Oven, Microscope, RT-PCR, ELISA, Filtration assembly

FISH & SEA FOODS/EGG AND EGG PRODUCTS

Fish & sea foods are very perishable, high-protein food that typically contains a high level of free amino acids. Microbes easily metabolize these proteins causing spoilage and intoxication. Freshly laid eggs are generally sterile, particularly the inner contents. However the shells get contaminated from the environmental sources such as fecal matter of the bird, beddings, by the handlers. Cracks in egg shell is a potential source of microbial contamination and spoilage.

PARAMETERS

Total Plate Count, Coliform counts, Yeast & Mold count, Detection and Enumeration of Staphylococcus aureus, Faecal Streptococci count, Detection and Enumeration of E. coli, Enumeration of Pseudomonas sp., Detection of Salmonella sp, Detection of Shigella sp, Detection of Clostridium perfringens.

METHOD OF ANALYSIS

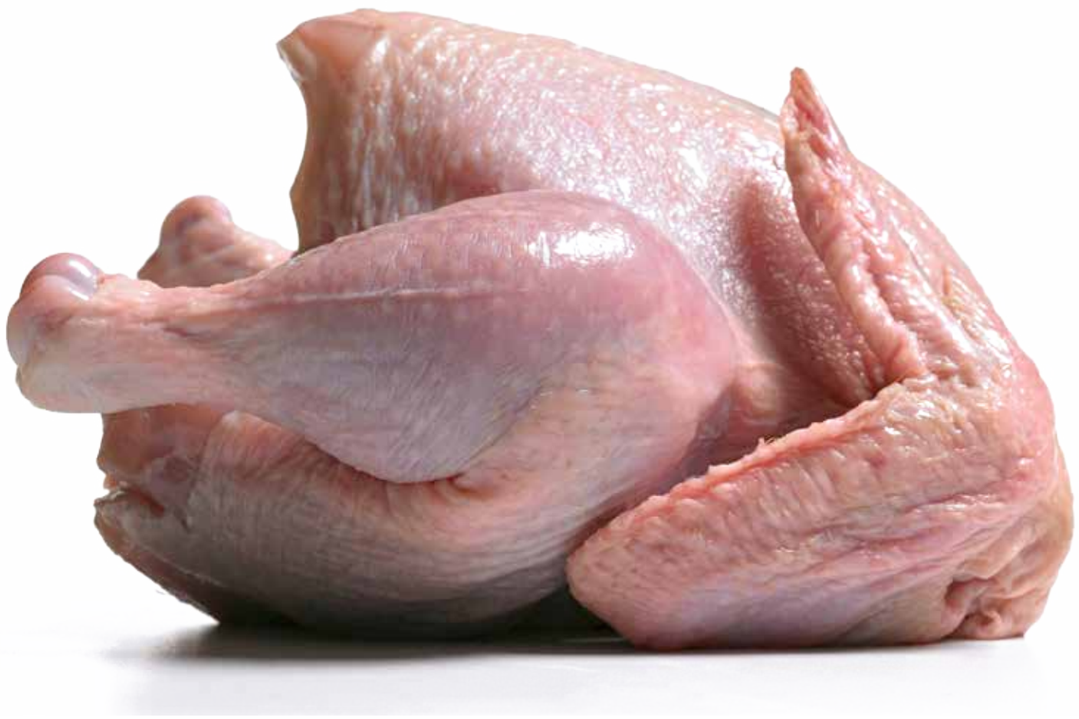
IS, ISO, BAM, APHA

INSTRUMENTS

Autoclave, Laminar Air Flow, Biosafety Cabinet, Incubator, CO2 incubator, Hot Air Oven, Microscope, RT-PCR, ELISA

MEAT & MEAT PRODUCTS

Meat is rich in nitrogenous compounds, proteins, minerals and accessory growth factors. It is an ideal culture medium for many organisms. Majority of the spoilage microorganisms are coming from external sources during unhygienic and improper handling and processing. Meat and meat products can serve as vehicles of many pathogenic microorganisms.



PARAMETERS

Total Plate Count, Coliform counts, Yeast & Mold count, Detection and Enumeration of Staphylococcus aureus, Detection and Enumeration of E.coli, Detection of Salmonella sp, Detection of Shigella sp, Detection of Listeria sp, Detection of Clostridium perfringens, Detection of Vibrio cholerae and V. parahaemolyticus, Enterobacteriaceae. All the parameters are tested in our lab for the meat and meat products.

METHOD OF ANALYSIS

IS, ISO, BAM, APHA

INSTRUMENTS

Autoclave, Laminar Air Flow, Biosafety Cabinet, Incubator, CO2 incubator, Hot Air Oven, Microscope, RT-PCR, ELISA

FRUIT & FRUIT PRODUCTS/ VEGETABLE AND VEGETABLE PRODUCTS

India is one of the largest producer of fruits and vegetables in the world. The cases of food borne illness are also increasing every year, which needs our special attention. Consumption of contaminated fruits, vegetables and their products can lead to food poisoning.

PARAMETERS

Total Plate Count, Coliform counts, Yeast & Mold count, Detection and Enumeration of Staphylococcus aureus, Faecal Streptococci count, Detection and Enumeration of E. coli, Enumeration of Pseudomonas sp., Detection of Salmonella sp, Detection of Shigella sp, Detection of Clostridium perfringens, Detection of Vibrio cholerae and V. parahaemolyticus.

METHOD OF ANALYSIS

IS, ISO, BAM, APHA

INSTRUMENTS

Autoclave, Laminar Air Flow, Biosafety Cabinet, Incubator, CO2 incubator, Hot Air Oven, Microscope, RT-PCR, ELISA

BIOBURDEN ANALYSIS OF CLEAN ROOM

Bioburden is normally defined as the number of bacteria living on a surface that has not been sterilized. Clean rooms and associated controlled environments provide the control of contamination to levels appropriate for accomplishing contamination-sensitive activities. Products and processes that benefit from the control of contamination include those in such industries as aerospace, electronics, medical devices, and pharmaceutical products requiring a variety of clean environments.

Environmental Monitoring (EM) is very important, particularly in pharmaceutical manufacturing facilities where the risk of microbial contamination is controlled through aseptic processing. Microbiological monitoring of an environment involves microbiological air quality evaluations on operators, the inside of the laboratories and surfaces. Such a program controls the viable microbial load (bioburden), and this monitoring provides data about the air system efficiency in operational procedures.

Alert and internal action at specific microbiological levels can be determined through frequent monitoring of the environment and operators. Therefore, deviations from normal conditions can be detected, allowing corrective procedures before product quality is affected.

We perform Bioburden analysis of clean room through settle plate Method for Total bacterial count and yeast & mould count. We also detect pathogens present in the area.

GMO TESTING

The DNA/GMO (Genetically Modified Organisms) Laboratory specializes in the testing of food and feed products for the presence of genetically modified traits, and offers additional expertise in commodities destined for Asian markets. In addition to GMO testing, our service offerings include detection of pathogenic microorganisms by real-time PCR, rice variety identification, and food allergen testing. We verify the accuracy and reliability of GMO testing methods by regularly participating in various national and international proficiency programs. Our quality effort begin at the sample preparation stage, where each step of the preparation process is closely monitored to prevent cross-contamination that could compromise test results, and all sample analysis procedures are traceable through our comprehensive laboratory information management system (LIMS).

The polymerase chain reaction (PCR) is a molecular biology technique for exponentially amplifying a fragment of DNA, via enzymatic replication, without using a living organism. It enables the detection of specific strands of DNA by making millions of copies of a target genetic sequence. The target sequence is essentially photocopied at an exponential rate, and simple visualization techniques can make the millions of copies easy to see.

ELISA

The enzyme-linked immunosorbent assay (ELISA) offers the most extensive collection of food allergen testing options available. We have assembled an array of test kits from all over the world. From rapid detection to immunoassay principals to our analytical testing services ELISA method offers our customers a variety of options to meet their testing needs.

ELISA is a test that uses antibodies and color change to identify and quantify a substance. We perform the detection of allergen (gluten, soy allergen etc.) from different matrixes like wheat, cereals etc. We have sufficient facilities with good infrastructure and technically competent scientists in our lab for testing of food allergens.

We also use ELISA method for rapid detection of Salmonella sp. in food samples

SWAB TESTING

The analysis of swab samples in a microbiological investigation can be an invaluable tool to help trace contamination pathways. This approach offers an opportunity to monitor bacteria around key infection routes. Various types of surfaces are used today in the food industry, such as plastic, stainless steel, glass, and wood. These surfaces are subject to contamination by microorganisms responsible for the cross-contamination of food by contact with working surfaces.

The HACCP-based processes are now widely used for the control of microbial hazards to prevent food safety issues. This preventive approach has resulted in the use of microbiological analyses of surfaces as one of the tools to control the hygiene of products. The method of recovering microorganisms from different solid surfaces is swab sampling.

We collect hand swab from the suspected persons, handling food materials directly.

PARAMETERS

Total bacterial count, Total fungal count, S.aureus, E. coli, Coliform, etc.

SPECIALIZED SERVICES

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FOOD DIVISION

OGRANIC ACIDS

A large number of acids are natural and major constituents of plant food. Acids may also be produced during fermentation or other operations. Organic acids have Carboxylic functional group and are weakly acidic. Beverage (juice & wine) industries utilize these acids for flavour, colour, and aroma enhancement and for stability and microbiological control. Legal & labeling, metabolic and functional research requirements necessitate food tests for Organic acids.

Concentration levels of many acids at which they are detectable is high making them difficult to detect. Chemical entities with "high UV absorption rate" property in samples can interfere with the detection of target analyte.

PARAMETERS

Organic : Acetic acid • Benzoic acid • Butyric acid • Caproic acid • Carbonic acid • Citric acid • Formic acid • Fumaric acid • Lactic acid • Malic acid • Oxalic acid • Propionic acid • Quinic acid • Shikimic acid • Succinic acid • Tartaric acid & Valeric acid

Phenolic : Chicoric acid, Echinacoside

INSTRUMENTS

HPLC-PDA • GC-FID • GC-MS/HS • ION CHROMATOGRAPH • AUTOTITRATOR

METHODS

FSSAI Lab Manual • IS • ISO • AOAC • DIN EN

GENETICALLY MODIFIED ORGANISM (GMO)

Genetically Modified Organism or GMO is any organism whose genetic makeup has been altered for added beneficial characteristics.

GMO technology intended to design pest, virus, climate resistant crops to cater to demands of feeding burgeoning global population. Incidence of GMO in food & feedstuff can either be intentional or unintentional.

GM foods either contain GMO ingredients or are those which have been manufactured using GMO meat or GMO agricultural raw materials. Food Testing for GMO is necessary as it is banned or restricted for consumption in many nations.

EFRAC offers fast TAT and accurate test results with demonstrable compliance with statutory requirements.

PARAMETERS

Amino acids • Fatty acid composition • Vitamins • Minerals • Metals • Secondary metabolites • Phytosterols • Carotenoids

INSTRUMENTS

PCR /RT-PCR • ELISA & Lateral Flow Device/ Dipstick

METHODS

Proximate Analysis • Immunologic • Genetic

TRIHALOMETHANES

Chlorination of water kills bacteria and viruses and contributes to maintenance of public health. However, the same is not without side effects. Trihalomethanes (THMs) are by-products of chlorine & chloroamine disinfection processes. Chlorine ion reacts with free organic matter to form THMs (chloroform, bromodichloromethane, dibromochloromethane, and bromoform) with levels varying with temperature, season, amount of chlorine used & plant material in water among others. THM's are considered potentially carcinogenic.

THM gets ingested on consumption of vegetables washed with and by eating contaminated meat of animals through drinking water. Direct inhalation while showering occurs on account of volatility of THM's. EPA has stipulated 80 parts /billion/year as the maximum amount allowable. Chloroamine may cause nitrification and corrosion and increase exposure to other byproducts, such as N-nitrosodimethylamine (NDMA). Testing for presence and quantification of THMs is thus necessary.

PARAMETERS

Bromoform, Dibromochloromethane, Bromodichloromethane, Chloroform, Fluoroform, ChlorodifluoromethaneIodoform

INSTRUMENTS

GC-MS/HS, GC-MS/P&T

METHODS

ASTM, APHA, AOAC, ISO, USEPA

SENSORY

Sensory Evaluation is a key component of Food Production Strategy. Sensory Analysis evaluates the experimental effects of Food Organoleptics - appearance /colour, odour, taste, smell, touch, response etc. on human senses i.e. sight, smell, taste, touch & hearing by applying scientific design and statistical analysis.

Reliable, accurate analyses can help with recipe refinement, product development and comparable market research. In particular, chances of a product's success increases if the sensory tests are efficiently done in cases of New Product Development, Investigation of new recipes, Checks for sustenance of quality & taste etc.

PARAMETERS

Colour, Odour, Taste, Flavour, Smell, Hydroxy compounds Aldehydes, Ketones, Acids, Esters, Sulfur compounds, Oxygen hetrocycles, Nitrogen hetrocycles, Sulfur heterocycles

INSTRUMENTS

e-Nose, e-Tongue, e-Eye (IRIS)

METHODS

IS, ISO, FSSAI, AOAC, PCA, DFA, SIMCA, PLS

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POLYCHLORINATED BIPHENYLS (PCB) & POLYCHLORINATED HYDROCARBONS (PAH)

A polychlorinated biphenyl (PCB) and Polycyclic aromatic hydrocarbons (PAHs)) are a class of chemicals that occur commercially & naturally from the source. Polychlorinated biphenyls (PCBs) are compounds derived from substitution of 1–10 hydrogen atoms of biphenyl by chlorine atoms. PCBs have been produced and used worldwide in large quantities for many years as transformer oils, metal-cutting oils, hydraulic oils, heat transfer fluids, additives in plastics, dyes, and carbonless copying paper.

Polycyclic aromatic hydrocarbons (PAHs) are occur naturally in coal, crude oil, and gasoline. They also are produced when coal, oil, gas, wood, garbage, and tobacco are burned. High-temperature cooking will form PAHs in meat and in other foods. Both the pollutant travel up the food chain through fish, mammals, birds.

PARAMETERS

POLYCHLORINATED BIPHENYLS

2-Chlorobiphenyl, 2,3-Dichlorobiphenyl, 2,2',5-Trichlorobiphenyl, 2,4,4'-Trichlorobiphenyl, 2,3,3'-Trichlorobiphenyl, 2,4',5-Trichlorobiphenyl, 2,2',3,5'-Tetrachlorobiphenyl, 2,2',4,6-Tetrachlorobiphenyl, 2,2',5,5'-Tetrachlorobiphenyl
2,2',3,4,5'-Pentachlorobiphenyl
2,2',4,5,5'-Pentachlorobiphenyl
2,3,3',4,4'-Pentachlorobiphenyl
2,3',4,4',5-Pentachlorobiphenyl
2,2',3,4,4',5'-Hexachlorobiphenyl
2,2',3,4',5',6-Hexachlorobiphenyl
2,2',4,4',5,5'-Hexachlorobiphenyl
2,2',3,3',4,4',5-Heptachlorobiphenyl
2,2',3,4,4',5,5'-Heptachlorobiphenyl
2,2',3,3',4,4',5,5'-Octachlorobiphenyl
2,2',4,4',5,6'-Hexachlorobiphenyl
2,2',3,4',5,6,6'-Heptachlorobiphenyl
2,2',3,3',4,5',6,6'-Octachlorobiphenyl
2,2',3,3',4,4',5,5',6,6'-Decachlorobiphenyl

POLYCYCLIC AROMATIC HYDROCARBON

Acenaphthene, Acenaphthylene, Anthracene, 1,2-Benzanthracene, Benz[a]pyrene, Benzo(b)fluoranthene, Benzo(g,h,i)perylene, Benzo(k)fluoranthene, Chrysene, Dibenz(a,h)anthracene, Fluoranthene, Fluorene, Indeno(1,2,3-cd)pyrene, Naphthalene, Phenanthrene, Pyrene, 3-Methylcholanthrene, 7,12-Dimethylbenz(a)Anthracene, Fluoranthene, Dibenz[a,l]pyrene, Dibenz[a,i]pyrene, Dibenz[a,h]pyrene, Benzo(j)fluoranthene, Benz(a)anthracene

INSTRUMENTS

HPLC-FLD, GC-MS, GC-MS/MS, GC-HR/MS

METHODS

APHA, AOAC, USEPA, ISO

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DIOXIN & FURAN

These compounds do not occur naturally, nor they are produced intentionally. A by-product of industrial processes such as waste incineration, chemical manufacturing and paper bleaching, dioxins and furans can be found in the air, in water and contaminated soil. These, then accumulate in animal tissues and pass onto humans through the food chain thereafter. Polychlorinated dibenzo-para-dioxin (PCDDs) and Polychlorinated dibenzofuran (PCDFs) are chlorinated aromatic compounds having tremendous toxic effects, carcinogenicity and persistence in the environment; hence these Persistent Organic Pollutants (POPs) are real threats to the environment and existence of mankind.

A byproduct of industrial processes such as waste incineration, chemical manufacturing and paper bleaching, dioxins and furans can be found in the air, in water and contaminated soil. These, then accumulate in animal tissues and pass onto humans through the food chain thereafter.

Short-term exposure of humans to high dioxin levels may result in skin lesions and altered liver function while long-term exposure is linked to immune system impairment, development of Nervous and Endocrine Systems and Reproductive Function.

PARAMETERS

2,3,7,8-tetrachlorodibenzo-p-dioxin
1,2,3,7,8-pentachlorodibenzo-p-dioxin
1,2,3,4,7,8-hexachlorodibenzo-p-dioxin
1,2,3,6,7,8-hexachlorodibenzo-p-dioxin
1,2,3,7,8,9-hexachlorodibenzo-p-dioxin
1,2,3,4,6,7,8-heptachlorodibenzo-p-dioxin
Octachlorodibenzo-p-dioxins,

Furan

2,3,7,8-tetrachlorodibenzofuran
1,2,3,7,8-pentachlorodibenzofuran
2,3,4,7,8-pentachlorodibenzofuran
1,2,3,4,7,8-hexachlorodibenzofuran
1,2,3,7,8,9-hexachlorodibenzofuran
1,2,3,6,7,8-hexachlorodibenzofuran
2,3,4,6,7,8-hexachlorodibenzofuran
1,2,3,4,6,7,8-heptachlorodibenzofuran
1,2,3,4,7,8,9-heptachlorodibenzofuran
1,2,3,4,6,7,8,9-octachlorodibenzofuran

Polychlorinated biphenyls (PCB)

3,3’4,4’-tetrachlorobiphenyl (PCB-77)
3,4,4’,5-tetrachlorobiphenyl (PCB-81)
3,3’,4,4’,5-pentachlorobiphenyl (PCB-126)
3,3’,4,4’,5,5’-hexachlorobiphenyl (PCB-169)
2,3,3’,4,4-pentachlorobiphenyl (PCB-105)
2,3’,4,4’,5-pentachlorobiphenyl (PCB-118)
2’,3,4,4’,5-pentachlorobiphenyl (PCB-123)
2,3,3’,4,4’,5-hexachlorobiphenyl (PCB-156)
2,3,3’,4,4’,5’-hexachlorobiphenyl (PCB-157)
2,3’,4,4’,5,5’-hexachlorobiphenyl (PCB-167)
2,3,4,4’,5-pentachlorobiphenyl (PCB-114)
2,2’,3,3’,4,4’,5-heptachlorobiphenyl (PCB-170)
2,2’,3,4,4’,5,5’-heptachlorobiphenyl (PCB-180)
2,3,3’,4,4’,5,5’-heptachlorobiphenyl (PCB-189)

INSTRUMENTS

GC-HRMS

METHODS

USEPA: 1613, USEPA: 23, USEPA: 613, USEPA: 8290A, EC: 1881/2006, EU 2017/644, EU: 589/2014

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VOLATILE ORGANIC COMPOUNDS(VOCs)

Odour is one of the decisive sensory experiences which humans use to decide the appeal or disavowal factor of the foods on offer. These odours, termed as Volatile organic compounds (VOCs) are low-molecular-weight organic compounds that easily evaporate at room temperature.

Food Analytics evaluates food composition, monitors changes upon processing or cooking and identifies the components that give rise to desirable or undesirable characteristics. VOC detection is important to ensure that damaging chemicals are controlled or eliminated and properties of desirable ones understood. A large number of odorous compounds released from food makes their separation and identification a challenging prospect and requires knowledge of techniques along with the expertise to identify the widest possible range of compounds from a single sample.

PARAMETERS

Benzene, Bromobenzene, Bromochloromethane, Bromodichloromethane, Bromoform, n-Butylbenzene, sec-Butylbenzene, tert-Butylbenzene, Carbon tetrachloride, Chlorobenzene, Chloroform, 2-Chlorotoluene, 4-Chlorotoluene, Dibromochloromethane, 1,2-Dibromo-3-chloropropane, 1,2-Dibromoethane, Dibromomethane, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 1,1-Dichloroethane, 1,2-Dichloroethane, 1,1-Dichloroethene, cis-1,2-Dichloroethene, trans-1,2-Dichloroethene, 1,2-Dichloropropane, 1,3-Dichloropropane, 2,2-Dichloropropane 1,1-Dichloropropene, cis-1,3-Dichloropropene, trans-1,3-Dichloropropene, Ethylbenzene, Hexachlorobutadiene, Isopropylbenzene, p-Isopropyltoluene, Methylene chloride, Naphthalene, n-Propylbenzene, Styrene, 1,1,1,2-Tetrachloroethane, 1,1,2,2-Tetrachloroethane, Tetrachloroethene, Toluene, 1,2,3-Trichlorobenzene, 1,2,4-Trichlorobenzene, 1,1,1-Trichloroethane, 1,1,2-Trichloroethane, Trichloroethene, 1,2,3-Trichloropropane, 1,2,4-Trimethylbenzene, o-Xylene, m-Xylene, p-Xylene, 1,3,5-Trimethylbenzene

INSTRUMENTS

GC-MS/HS, GC-MS/P&T, GC-MS/MS, GC-FID

METHODS

APHA, AOAC, ISO, USEPA, ASTM

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FOR TESTING RELATED ENQUIRIES
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