BIO
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Shriram Institute for Industrial Research

TOXICOLOGY

A wide range of toxicological studies are undertaken as per National and International guidelines. All studies conducted at SRI are in accordance with the regulatory requirements of OECD, Schedule Y, EU, EPA, ICH, OPPTS, ISO & CIB guidelines etc. SRI has been recommended by US FDA for 510K registration for testing of medical devices.

Major Thrust Areas

- Agrochemicals and Petrochemicals
- Drugs and Pharmaceuticals
- Herbal Formulations and Ayurvedic Drugs
- Cosmetics & Personal Care Products
- Packaging Materials for Drugs, Food and Farm Product.
- Medical Devices & Contraceptives
- Genetically Modified Crops & Organisms
- Dyes and Dye Intermediates
- Toys

STUDIES UNDERTAKEN

1) **Acute / Single Dose Toxicity Study :**
   - Oral • Dermal • Inhalation
   - Intravenous • Intraperitoneal
   - Other Protocol Specified Route
2) **Irritation Study :**
   - Irritation to Mucous Membrane
   - Primary Skin Irritation/Acute Dermal/ Corrosion
   - Acute Eye / Vaginal / Penile / Rectal Irritation/ Photo Irritation / Photo Toxicity
3) **Skin Sensitization /Allergenicity/ Hypersensitivity Studies**
   - Buehler's Method •Maximization Method
4) **Sub chronic/ Sub acute / Repeated dose Toxicity Study :**
   - Oral • Dermal • Inhalation
   - Intravenous • Intraperitoneal
   - Other Protocol Specified Route
5) **Chronic Toxicity Studies**
   - Oral • Dermal • Inhalation
   - Intravenous • Intraperitoneal
   - Other Protocol Specified Route
6) **Reproductive Toxicity:**
   a) Reproduction/Developmental Toxicity Study
   b) Prenatal Developmental Toxicity Study
   c) One/ Two Generation Studies
7) **Carcinogenicity**
8) **Mutagenicity/ Genotoxicity**
   - In-Vitro Method : Ame's Test (Bacterial Reverse Mutation Assay)
   - In-Vivo Method : Mammalian Erythrocyte Micronucleus Study
   - In-Vivo Method : Mammalian Bone Marrow Chromosomal Aberration Study
9) **Biocompatibility Study :**
   - In-Vivo method : Systemic/Intracutaneous Toxicity/Implantation/Sensitization/ Intraperitoneal/Sub Chronic/ Genotoxicity/Haemocompatibility.
   - In- Vitro Method : Cytotoxicity
10) **Ecotoxicology Studies**
    - Bee • Fish • Daphnia
    - Earthworms
    - Birds (Chicken, Pigeon & Quails)
11) **Supplementary toxicity Studies**
    - Neurotoxicity Studies on Egg Laying Hens & Rodents
    - Synergism & Potentiation Studies (Combined Effects of Various Chemicals)
12) **Skin Irritation & Sensitization Tests on Human Volunteers**

ANIMAL HOUSE :

To cater to the needs of industries for regulatory toxicology an animal house facility has been maintained which houses :

• Mice – Rats • Rabbits • Guinea Pigs
• Chicken • Pigeon • Quails

INSTRUMENTS :

For various Biochemical, Histopathological and Haematological parameters the toxicology division houses a variety of instruments like :

- Haematology Analyzer - Biochemistry Analyzer
- Various microscopes including Inverted Microscope
- Urine Analyzer
- Inhalation Instrument (Nose only)
- CO2 Incubator
- Automatic Tissue Processor
- Deep Freezer
- Microtome

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ANALYTICAL SUPPORT : DRUGS, PHARMACEUTICALS, HEALTHCARE & HERBAL PRODUCTS

Deals With • Allopathic • Ayurvedic • Homeopathic • Unani, Siddha & Traditional Medicines

Raw Materials

Finished Products

Quality Evaluation as per the Various Pharmacopoeias
- Indian, United States, British, European, Japanese, Martindales British Herbal, Ayurvedic, Unani,.etc.
- Drugs & Cosmetic Act, BIS, ISO, WHO Guidelines.
- In House Validated Methods, Sponsor's Specifications

• Oral Solids	:	Tablets, Capsules, Powders
• Oral Liquids	:	Syrups, Suspensions, Emulsions
• Topical Semi Solids	:	Creams, Gels, Pastes, Ointments
• Ophthalmic	:	Ointments, Liquids, Gels
• Parentral Products	:	Injections, Implantation
• Aerosols	:	Sprays, Foams
• Surgical Items	:	Dressings, Gauges, Sutures, Adhesive Tapes, Syringes & Needles
• Mechanical Contraceptives	:	Condoms, Copper-T, Tubal Rings
• Cosmetic & Personal Care Products	:	Diapers, Hair Oils, Skin Creams, Skin Powders, Hair Dyes, Shampoo, Lipstick, Nail Polish etc.

Major Parameters studied for quality evaluation

Physical:
- Description, Dimensions, Absorbency
- Adhesion & Tensile Strength,
- Scouring Loss, Fracture & Friction Force
- Burst Volume & Burst Pressure
- Pouch Burst & Pouch Integrity;
- Disintegration Time

Microbiological/Pharmacological:
- Microbiological Assays, Sterility
- Microbial Limit Test for Pathogenic Organisms, Lactic Acid Bacillus
- Pyrogen/Bacterial Endotoxins/LAL test
- Undue/Abnormal Toxicity, Oxytocic Activity

Chemical/Instrumental:
- Identification, Uniformity of Content, Assay
- Uniformity of Weight/Mass/Volume/Fill
- Dissolution Behaviour
- Related Substances, Residual Solvents
- Organic Volatile Impurities
- Presence of Steroids, Heavy Metals
- Phytochemicals Profiling
- Particle Size, Fatty Acids & Esters
- Acid Value, Peroxide Value
- Saponification Value, Iodine Value
- Optical Rotation, Refractive Index

Thrust Areas of Drugs & Pharmaceuticals

- Bio-availability Studies for Active Ingredients in Clinical Specimens
- Process Validation for Manufacturing of Herbal & Healthcare products
- Stability Studies & Shelf-life Studies as per the ICH Guidelines under Accelerated Conditions of Temperature, Humidity & Light
- New Analytical Method Development and Validation as per International Standards
- Identification of Impurities of unknown Compounds in Various Matrices
- Identification and Quantitation of Degradation Products
- Method Standardization & Chemical Fingerprinting of Herbal & Healthcare Products
- Studies on Packaging Materials for Drugs & Healthcare Products
- Quality Evaluation & Certification of Products for Various Parameters

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ANALYTICAL SUPPORT : MICROBIOLOGY CENTRE

The centralized facility is equipped with HVAC system as per class 10,000 meeting the requirements under ISO 14644. SRI undertakes various studies for the detection, enumeration and identification of pathogenic organisms including the pathogens as per various regulatory directives.

ACTIVITY AREA:

- Pathogenic Microbial Identification
- Handling Food and Water Borne Pathogens
- Sterility Assurance
- Efficacy Studies of Cleaners, Disinfectants Sanitizers & Antimicrobial Preservative
- Bacterial Endotoxin test & Bioburden Studies
- Shelf Life Studies
- Antibiotic Resistant Studies
- Vitamins Studies
- Organizing International Training Programmes
- Environmental Monitoring
- Preclinical Studies
- Preservation and Maintenance of Reference Cultures
- Method Validation for Microbiological Methods
- Microbiological Consultancy
- Initiation and Participation in Interlab Comparison Programmes (ILC)
- Detection of Mycotoxins & Vitamins through ELISA Method

FOCUS AREAS :

- Facilities for Bacterial Efficacy Studies of Water Purifiers, Disinfectants, Sanitizers and Antiseptics
- Clinical Research Studies on Human Volunteers for Handwash Products
- Minimum Inhibitory Concentration (MIC) and Preservative Efficacy Studies of Disinfectants
- Bioefficacy Studies of Sanitizers and Disinfectants
- Pathogenic Micro-organism's Detection Studies in Different Milk Products
- Method Verification and Validation Studies of Salmonella, E.coli, Listeria and Staphylococcus Aureus
- Stability Studies on Nanotechnology Based Anticancer Drugs
- Anibacterial Efficacy Study of Silver Nanowashing Machine, Refrigerators & Mobile Phone Screen Guards.
- Method Validation Studies on Bioburden of Medical Devices
- Quality Evaluation of Ganga Water for its Entire Stretch in India
- Studies for Enhancement in the Shelf Life of Food Grade Products

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ANALYTICAL SUPPORT: MOLECULAR BIOLOGY

Molecular Biology laboratory is at the forefront of innovation in life sciences research, technology development & transfer and provides outstanding services to the society. Molecular Biology laboratory employs modern biological techniques for detection and quantification of various parameters at the molecular level. Laboratory provides services in DNA/RNA level analysis as well as protein based analysis.

ACTIVITIES:

1. DNA/RNA Extraction, Quantification and Analysis
2. Relative and Absolute Quantification of DNA Using Real Time-PCR
3. Protein Detection, Quantification and Analysis by PAGE and Western Blotting
4. Molecular Diagnostic Testing
5. Detection of Viral Contamination by PCR and Real Time-PCR
6. Gene Expression Analysis & Allelic Discrimination Using Real Time–pcr
7. DNA Fingerprinting & Genotyping

FOCUS AREAS:

1. Detection of Genetically Modified Organisms (GMO) using PCR Based Method
2. Detection of Food Borne Pathogens using PCR Based Technique
3. PCR-Based Allergen Detection and Quantification in Food Matrices
4. Detection and Differentiation of Source Animal Species in Meat
5. Detection and Differentiation of Milk Adulteration (Cow/Buffalo)
6. Protein Based Detection for Allergen and Food Borne Pathogens
7. Varietal Identification of Basmati Rice and other Food/ Feed Crops
8. Differentiation of Basmati and Non-Basmati Variety Rice
9. Viral Detection in Food, Feed and Drinking Water
10. Isolation and Detection of Plant Pathogens using End Point PCR/ Real Time-PCR

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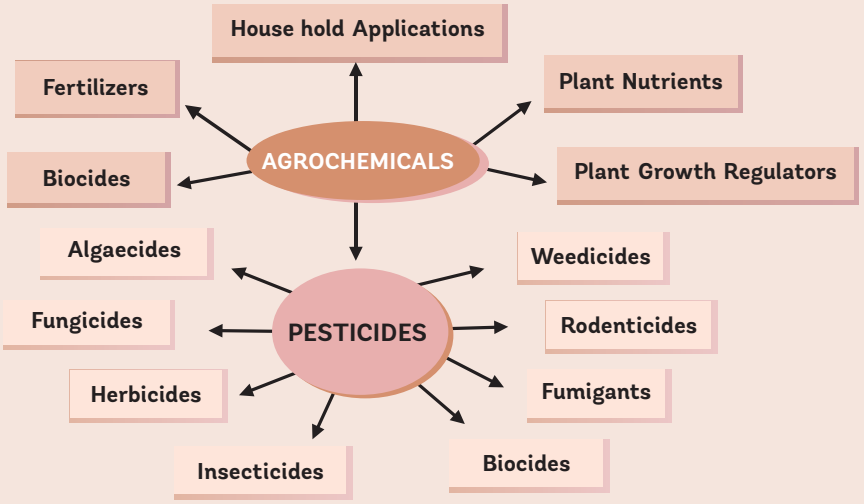
ANALYTICAL SUPPORT: CHEMICALS, PESTICIDES AND AGROCHEMICALS

With our extensive process knowledge and testing lab facilities we offer comprehensive analysis and testing of several agrochemicals:



Guidelines and Protocols for Pesticide Analysis

1. Analysis is done as per both National and International Standards with Following Major Protocols:
   - Bureau of Indian Standard Specifications
   - CIPAC Guidelines
   - WHO Specifications
   - FAO Specifications
   - AOAC Guidelines
   - OECD Specifications
2. In-house Validated Method and Procedure
3. Customer's Specification

Developmental Trends & Thrust Areas:

SRI undertakes research in agrochemical analytical technology, in the broadest and widest manner for advancing pesticide formulation research and development, thereby helping in public welfare and aiding the development of agrochemical industries. The major thrust areas are:

- Analyzing and certifying pesticides both technical grade and formulations for their safe use and conformity to various national or international specifications
- Replacing the existing classical methods with more accurate, precise and time saving latest instrumental methods of analysis.
- Impurity profiling of technical grade pesticides with complete profiling of the molecule including identifying and quantifying the impurities (process related and degradation by-products) along with the quantification of active ingredient.
- Undertaking studies for shelf life and enhancement of shelf life, container compatibility studies and persistence studies as per the CIB guidelines.
- Undertaking Five Batch Analyses, primarily on generic actives utilizing chromatography and mass spectrometry to separate, identify and quantify the impurities present apart from determination of active ingredients, physico-chemical tests and spectral analysis.
- Method development & validation of various agrochemical products for determination of active ingredients as per ICH guidelines.
- Persistence/ Residue studies of the pesticides in water, soil & different crop commodities.
- Providing solutions to customer-specific requirements for the development of different type of pesticides formulations.

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RESIDUAL ANALYSIS

Quality of any product is considered to be attributed due to its bulk properties. However in today's changing global scenario the quality of any is assessed on the basis of residual impurities present in it.

The lab is committed to conduct analysis as per various national as well as international protocols for not only various contaminants, adulterants, toxicants but also elements and nutrients present in trace amounts e.g. residues of pesticides, drugs, toxic metals, mycotoxins, environmental pollutants, vitamins, macro as well as micro-nutrients etc. in various matrices like water, raw and processed food products of plant origin (fruits and vegetables, cereal grains, oil seeds etc.), Raw and processed food products of animal origin (dairy, egg, meat, fishery products etc.), Biological samples (Blood, serum etc.), Cosmetics and personal care products (creams, lotion, powders etc.), Herbal medicines, soil, sludge, polymer, toys etc.

ACTIVITY AREA :

1. Suitability Study of Packaging Material as per EP/BP.
2. REACH, RoHS Parameters.
3. Physico-Chemical Parameters of Refrigerants.
4. Analysis of Different Matrices for Pentachlorophenol, Haloacetic Acids, Acrylamide,Trihalomethanes, Phthalates, Formaldehyde.
5. Acetaldehyde in Polymer (PET).
6. Identification of unknown Chemicals (Pesticide/Drugs/Organic Chemical).
7. Phthalates in Toys.
8. Bis Phenol-A in Feeding Bottle.
9. Migration of Certain Elements for Determination of Safety Requirements of Toys.
10. Pesticide, Drug Residues, Heavy Metals, Aflatoxins, Banned Dyes in Food Products.
11. Banned Drug Residues (Steroids) in Cosmetics and Food Supplements.
12. Compositional as well as Impurity Analysis in Fuel Gases.
13. Profiling of Crude Oil for its Composition.
14. Melamine in Milk and Dairy Products.
15. Molecular Weight Determination by GPC.
16. Partition Coefficients and Dissociation Constant of API.
17. Formaldehyde in Textiles / Leather Goods.
18. Residue Ethylene Oxide, Ethylene Glycol & Ethylene Chlorohydrins in Medical Devices.
19. VOC in Paints and Coating Materials.
20. Persistence Study of Pesticides in Agri-produce, Environment (Water and Soil).
21. Extractable, Leachable (EN71) and Total Heavy Metals Content.

QUALITY NORMS/STANDARDS/PROTOCOLS FOLLOWED :

The analysis is carried out as per National as well as International standards as mentioned below:

BIS / FSSAI / PFA / AOAC / AOCS / ASTM / IP / ARI / Pharmacopeia Methods / FCC / USEPA / IS / APHA / PAM / OECD/Spice Board of India / DGHS Manual / In-house Validated Methods.

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ANIMAL FEEDS

Phase	Focus Area	Services Offered
Raw Materials	▸ Quality ▸ Residue	▸ Analysis of Animal Feeds for Chemical and Microbiological Parameters ▸ Residue Analysis (Aflatoxins, Pesticides, PCBs, PAHs, Heavy Metals)
Formulation	▸ Nutrition	▸ Nutritional Profiling of Animal Feeds ▸ Recommendation for Fortification or Deletion of Antinutrients Containing Materials
Finished Product	▸ Quality ▸ Residue	▸ Quality as per Legal Requirements, Quality Certification for Microbial Load and Chemical Parameters ▸ Residue Analysis, Quality Certification
Packaging	▸ Quality	▸ Quality Evaluation and Suitability of Packaging Materials

Protocols/Specifications Followed for Product Certification:
BIS Specifications, ISO Specifications, AOAC International.

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EGGS & POULTRY PRODUCTS

Phase	Focus Area	Services Offered
Slaughtering	▸ Hygiene of Slaughter House	▸ Swab Test
Raw Chicken/ Egg	▸ Quality ▸ Residue	▸ Analysis of Egg and Chicken for Chemical and Microbiological Parameters. ▸ Residue Analysis (Pesticides, Antibiotics, Hormones, Aflatoxins, API, Heavy Metals) ▸ Quality Certification
Processing	▸ Efficacy	▸ Monitoring Efficacy of Processing Equipments through Analysis of Chicken Products ▸ Post-processing Contamination Analysis
Processed Chicken/ Egg Powder	▸ Quality ▸ Residue	▸ Quality as per Legal Requirements ▸ Quality Certification for Microbial Load and Nutritional Parameters ▸ Residue Analysis
Packaging	▸ Quality ▸ Shelf-life	▸ Quality Evaluation and Suitability of Packaging Materials ▸ Shelf-life Determination of Packaged Chicken or Egg Powder

Protocols/Specifications Followed for Product Certification:
BIS Specifications, ISO Specifications, AOAC International, FSSR.

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MEAT AND MEAT PRODUCTS

Phase	Focus Area	Services Offered
Slaughtering	▸ Hygiene of Slaughter House	▸ Swab Test
Raw Meat	▸ Quality ▸ Residue	▸ Analysis of Meat for Chemical and Microbiological Parameters ▸ Residue Analysis (Pesticides, Antibiotics, Hormones, Aflatoxins, Pharmacological Active Substances, Heavy Metals)
Processing	▸ Efficacy	▸ Monitoring Efficacy of Processing Equipments through Analysis of Meat Products ▸ Post-processing Contamination Analysis
Processed Meat	▸ Quality ▸ Residue	▸ Quality as per Legal Requirements ▸ Product Certification for Microbial Load, Nutritional Parameters and Residue Analysis
Packaging	▸ Quality ▸ Shelf-life	▸ Quality Evaluation and Suitability of Packaging Materials ▸ Shelf-life Determination of Packaged Meat Products

Protocols/Specifications Followed for Product Certification:
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FISH/MARINE PRODUCTS

Phase	Focus Area	Services Offered
Raw Fish/ Marine Products	▸ Quality Residue	▸ Analysis of Fish for Chemical and Microbiological Parameters ▸ Residue Analysis (Pesticides, Toxins, Heavy Metals)
Processing	▸ Efficacy	▸ Monitoring Efficacy of Processing Equipments through Analysis of Fish Products ▸ Post-processing Contamination Analysis
Processed Fish	▸ Quality ▸ Residue	▸ Quality as per Legal Requirements ▸ Quality Certification for Microbial Load and Nutritional Parameters
Packaging	▸ Quality ▸ Shelf-life	▸ Quality Evaluation and Suitability of Packaging Materials ▸ Shelf-life Determination of Packaged Fish/Marine Products

Protocols/Specifications Followed for Product Certification:
BIS Specifications, ISO Specifications, AOAC International, FSSR.

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AGRICULTURAL PRODUCTS

Phase	Focus Area	Services Offered
Seeds	▸ Preservation ▸ Fumigation	▸ Evaluation of Quality of Seeds ▸ Recommendation for Treatments to Seeds ▸ Irradiation of Seeds for Quality Improvement
Agriculture	▸ Agrochemicals ▸ Organic	▸ Residue Analysis (Pesticides, Heavy Metals) ▸ Organic Certification of Products
Harvesting	▸ Contaminants ▸ Stone ▸ Straw	▸ Residual Contaminant Analysis ▸ Methods for Monitoring the Level of Contaminants
Packaging	▸ Packaging Material	▸ Quality Evaluation Suitability of Packaging Material
Storage	▸ Mycotoxins ▸ Fumigants ▸ Insect Infestation ▸ Stones ▸ Filth	▸ Analysis of Mycotoxins (Aflatoxins, Ochratoxins, Patulin, Zearalenone, Plant Toxins) ▸ Determination of Insect Infestation, Fumigants and Agrochemicals used for Storage
Shelf-life	▸ Biochemical Reactions ▸ Preservation ▸ Micro-organisms	▸ Shelf-life Determination ▸ Measurement of Efficacy of Preservation ▸ Shelf-life Enhancement by Irradiation Processing ▸ Analysis for Micro-organisms, Degradation Products

Protocols/Specifications Followed for Product Certification:
BIS Specifications, ISO Specifications, AOAC International, AACC methods, FSSR.

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HORTICULTURAL PRODUCTS

Phase	Focus Area	Services Offered
Harvesting	▸ Contamination	▸ Residual Contaminant Analysis (Pesticides, Heavy Metals, Mycotoxins etc.) ▸ Quality Evaluation of Horticultural Produce for Nutritional Parameters
Packaging	▸ Packaging Material	▸ Quality Evaluation and Suitability of Packaging Material ▸ Residual Contaminants of Fumigants etc.
Storage	▸ Mycotoxins ▸ Fumigants ▸ Insect Infestation ▸ Stones ▸ Filth	▸ Analysis of Pesticides, Heavy Metals, Mycotoxins, Fumigants etc. ▸ Determination of Insect Infestation and Agrochemical used During Storage
Shelf-life	▸ Biochemical reactions ▸ Preservation ▸ Micro-organisms	▸ Shelf-life Determination at Ambient and Different Storage Conditions ▸ Measurement of Efficacy of Preservation ▸ Shelf-life Enhancement ▸ Analysis for Micro-organisms, Preservatives, and Degradation Products

Protocols/Specifications Followed for Product Certification:
BIS Specifications, ISO Specifications, AOAC International, FSSR.

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SUGAR AND CONFECTIONERY

Phase	Focus Area	Services Offered
Raw Sugar	▸ Quality ▸ Residue	▸ Analysis for Chemical and Microbiological Parameters ▸ Residue Analysis (Pesticides, Heavy Metals) ▸ Quality Certification
Processing	▸ Efficacy	▸ Assurance of Quality During Process.
Refined Sugar/ Confectionery	▸ Quality ▸ Residue	▸ Quality as per Legal Requirements ▸ Quality Certification for Microbial Load and Nutritional Parameters ▸ Residue Analysis (Pesticides, Heavy Metals)
Packaging	▸ Quality ▸ Shelf-life	▸ quality Evaluation and Suitability of Packaging Materials ▸ Shelf-life Determination of Packaged Sugar/ Confectionery Products

Protocols/Specifications Followed for Product Certification:
BIS Specifications, ISO Specifications, AOAC International, FSSR.

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APICULTURAL PRODUCTS

Phase	Focus Area	Services Offered
Extraction	▸ Contamination	▸ Residual Contaminant of Antibiotics, Pesticides, Heavy Metals, Micro-organism etc. ▸ Quality Evaluation of Apicultural Produce
Processing	▸ Contamination	▸ Residual Ontamination from Processing Equipment. ▸ Leachability & Migration Study
Packaging	▸ Packaging Material	▸ Quality Evaluation and Suitability of Packaging Material. ▸ Leachability & Migration Study
Storage	▸ Micro-organisms	▸ Analysis of Micro-organisms
Shelf-life	▸ Biochemical Reactions ▸ Preservation ▸ Micro-organisms	▸ Shelf-life Determination at Ambient and Different Storage Conditions ▸ Measurement of Efficacy of Preservation ▸ Shelf-life Enhancement ▸ Analysis for Micro-organisms, Preservatives, and Degradation Products ▸ Residual Contaminant of Antibiotics, Pesticides, Heavy Metals, Micro-organism etc. ▸ Quality Evaluation of Apicultural Produce

Protocols/Specifications Followed for Product Certification:
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VEGETABLE OILS AND FATS

Phase	Focus Area	Services Offered
Deoiling / Defatting	▸ Efficiency	▸ Efficiency of Oil Extractor
Crude Oil	▸ Quality	▸ Analysis of Crude Oil for Quality Evaluation
Processing	▸ Fractionation ▸ Solvent Extraction ▸ Refining ▸ Bleaching ▸ Deodorizing	▸ Characterization of Oil ▸ Bleaching Efficiency ▸ Residual Solvent
Refined Oil	▸ Quality ▸ Residue	▸ Quality as per Legal Requirements ▸ Adulteration and Quality Certification Residual Pesticides and Metals ▸ Fatty Acid Profiling Including MUFA, PUFA, SFA, Trans Fat
Packaging	▸ Quality ▸ Shelf-life	▸ Quality Evaluation and Suitability of Packaging Materials ▸ Shelf-life Determination of Fresh and used Oil

Protocols/Specifications Followed for Product Certification:
BIS Specifications, ISO Specifications, AOAC International, FSSR.

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MILK AND MILK PRODUCTS

Phase	Focus Area	Services Offered
Milking	▸ Hygiene	▸ Swab Test ▸ Mastitis ▸ Recommendation for Treatment of Animal
Milk	▸ Adulteration ▸ Residue ▸ Quality	▸ Analysis of Adulterants ▸ Residue Analysis (Pesticides, Antibiotics, Hormones, Aflatoxins, Pharamocological Active Substances, Heavy Metals) ▸ Checking of Milk for Suitability for Processing, Quality Certification
Processing	▸ Efficacy (Pasteurization, Sterilization, Homogenization, etc.)	▸ Monitoring Efficacy of Processing Equipments through Analysis of Milk or its Products ▸ Post-processing Contamination Analysis
Processed Milk	▸ Quality ▸ Residues	▸ Quality as per Legal Requirements ▸ Analysis for Microbial Load ▸ Residue Analysis ▸ Nutritional Profiling
Dairy Products	▸ Quality ▸ Residues	▸ Rheological, Chemical and Microbiological and Nutritional Facts of Dairy Products ▸ Residue Analysis
Packaging	▸ Quality ▸ Shelf-life	▸ Quality Evaluation and Suitability of Packaging Materials ▸ Shelf-life Determination of Packaged Milk or Dairy Products ▸ Microbiological Evaluation

Protocols/Specifications Followed for Product Certification:
BIS Specifications, ISO Specifications, AOAC International, American Dairy Products Institute, FSSR.



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BIO
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HERBAL PRODUCTS

Phase	Focus Area	Services Offered
Raw Materials	▸ Quality ▸ Residue	▸ Identification and Characterization of Herbs ▸ Analysis of Herbs for Chemical (Active Ingredients) and Microbiological Parameters ▸ Residue Analysis (Pesticides, PCBs, PAHs, Heavy Metals, Aflatoxins)
Extraction & Processing	▸ Extraction of Active Bio-components ▸ Biochemical Reactions	▸ Validation of Extraction Procedures and other Processing Parameters
Finished Product	▸ Quality ▸ Toxicity and Safety ▸ Bio-availability ▸ Residue ▸ Synergistic Effects ▸ Analytical Methods	▸ Quality Certification for Microbial Load and Physical and Chemical Parameters ▸ Residue Analysis for Contaminants ▸ Toxicity and Pharamacological Studies ▸ Analytical Method Development and Validation ▸ Label Claim
Packaging	▸ Quality	▸ Quality Evaluation and Suitability of Packaging Materials

Protocols/Specifications Followed for Product Certification:
BIS Specifications, ISO Specifications, AOAC International, Ayurveda Pharmacopoeia.

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ALCOHOLIC DRINKS/SOFT DRINKS

Phase	Focus Area	Services Offered
Raw Materials	▸ Quality ▸ Residue	▸ Analysis of Raw Materials for Chemical and Microbiological Parameters ▸ Residue Analysis (Pesticides, PCBs, PAHs, Heavy Metals)
Manufacturing	▸ Defects	▸ Checking of Defects in the Product Quality using Instrumental Analysis ▸ Post-processing Contamination Analysis
Finished Product	▸ Quality ▸ Residue	▸ Quality as per Legal Requirements ▸ Quality Certification for Microbial Load and Chemical Parameters ▸ Residue Analysis
Packaging	▸ Quality ▸ Shelf-life	▸ Quality Evaluation and Suitability of Packaging Materials ▸ Shelf-life Determination of Packaged Beverages/Drinks

Protocols/Specifications Followed for Product Certification:
BIS Specifications, ISO Specifications, AOAC International, FSSR.

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SPICES AND CONDIMENTS

Phase	Focus Area	Services Offered
Raw	▸ Quality ▸ Residue	▸ Analysis for Chemical and Microbiological Parameters ▸ Residue Analysis (Pesticides, Heavy Metals, etc.) ▸ Quality Certification
Processing	▸ Efficacy	▸ Monitoring Efficacy of Processing Equipment through Analysis of Spices and Condiments ▸ Post-processing Contamination Analysis
Processed	▸ Quality ▸ Residue	▸ Quality as per Legal Requirements ▸ Quality Certification for Microbial Load and Nutritional Parameters ▸ Residue Analysis
Packaging	▸ Quality ▸ Shelf-life	▸ Quality Evaluation and Suitability of Packaging Materials ▸ Shelf-life Determination of Packaged Products, Irradiation of Spices and Condiments for Improvement of Shelf-life

Protocols/Specifications Followed for Product Certification:
BIS Specifications, ISO Specifications, AOAC International, Spice Board of India, FSSR.



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FOOD AND FARM

Shriram Institute for Industrial Research (SRI) supports regulatory bodies in mandatory certification of Food and Agri-products for export and import. SRI offers food testing service to the food industry for nutritional labeling, food quality and safety evaluations and shelf life studies.

PRODUCTS TESTED :

- Alcoholic and Non-alcoholic Drinks, Beverages, Animal and Pet Feeds
- Bakery & Confectionery
- Cereal, Pulses & other Agri-products
- Coffee, Tea & Cocoa Products
- Cooked & Processed Food Products
- Cosmetic & Toiletries
- Essential Oils
- Fish & Sea Foods
- Meat & Meat Products
- Egg & Egg Products
- Food Additives
- Fruit, Vegetable & Related Products
- Honey & Apiculture Produce
- Milk & Milk Products
- Infant Foods
- Oil, Fats & Related Products
- Soaps & Detergents
- Spices & Condiments
- Sugar & By-products
- Tobacco & Related Products
- Starch & Starch Products

PARAMETERS CONDUCTED :

- ✓ **Quality and Safety Parameters as per National and International Standards**
- ✓ **Proximate and Nutritional Facts**
- Water-Soluble and Oil-soluble Vitamins
- Amino Acid Profile
- Fatty Acid Profile
- Minerals
- Added Food Colour, Preservatives and
- Antioxidants

Contaminants

- Heavy Metals
- Naturally Occurring Toxic Substances
- Mycotoxins
- Pesticide Residues, Antibiotic and Drug Residues
- Phthalates, Bisphenol A, Histamine, Nitrosamines

Rheological Studies

Sensory Evaluation

Adulterants

- Melamine
- Banned Dyes
- Artificial Sweeteners

Migration Studies from Packaging Materials

Shelf-life Studies

Service Quality in Food Testing

SRI provides testing and inspection services with highly reliable results and fast turn-around-time of reporting with the help of experienced and qualified scientists. SRI has centralized state-of-the-art equipment facilities for food testing as follows:

- ➢ Brookfield Viscometer
- ➢ Digital Refractometer
- ➢ Digital Polarimeter
- ➢ UV-Vis Spectrophotometer
- ➢ Lovibond Tintometer
- ➢ Karl Fischer Titrator
- ➢ CHNS Analyzer
- ➢ Alveo-Consistograph
- ➢ Ph Meter
- ➢ Conductivity Meter
- ➢ Elisa Reader
- ➢ HPTLC, HPLC, LC-MS/MS
- ➢ GC, GC-MS
- ➢ Microwave Digester
- ➢ AAS, ICP-OES & ICP-MS
- ➢ Particle Size Analyzer
- ➢ Ion Chromatography
- ➢ Rheometer
- ➢ Specific Ion Meter
- ➢ FTIR

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