

Nutritional Values		Nutraceutical Products	Residual Pesticides	Heavy Metals	Vitamins & Minerals	Fatty Acid Profile	Mycotoxins	Shelf Life Study	Food Additives Preservatives:	NOTS	Adulteration in Food	Microbiology Analysis
Energy		Proximate Analysis: Evaluation of energy, proteins, total fats, carbohydrates, total sugars, and dietary fibre. Minerals: Quantification of specific vitamins (e.g., Vitamin A, B-complex, C, D, E) and minerals (e.g., calcium, iron, zinc). The individual nutrient content must meet or exceed the recommended daily allowance (RDA).	Organochlorines: Compounds such as DDT, Aldrin, Lindane, and Endosulfan.	Lead (Pb)	Items: Vitamin A (Retinol/RE), Vitamin D, Vitamin E, Vitamin K, Vitamin C, and the B-Complex group B1, B2,B3, B5,B6, B7,B9/Folic Acid, and B 12.	Saturated Fatty Acids (SFAs)	total Aflatoxins & Aflatoxin (E,11): Monitored heavily in cereals, pulses, spices, and nuts.	Microbiological Parameters	Analysis includes maximum limits for benzoic acid, sorbic acid, sulphur dioxide, propionic acid, and nitrites using methods like HPLC and Spectrophotometry.	Plant Toxins: Found in botanicals, oils, and honey.	Milk and Dairy Products	
Protein		The individual nutrient content must meet or exceed the recommended daily allowance (RDA).	Organophosphates: Common compounds like Chlorpyrifos, Malathion, and Monocrotophos.	Arsenic (As)	Minerals: Calcium (Ca), Iron (Fe), Zinc (Zn), Magnesium (Mg), Phosphorus (P), Potassium (K), Sodium (Na), Copper (Cu), and Manganese (Mn).	Profiles typically analyze the following carbon-chain lengths (from Short to Long):	Aflatoxin (M,11): Specifically targeted for dairy products.	Evaluates for spoilage and pathogenic organisms to guarantee the product is safe for consumption. [1, 2, 3, 4]	Sweeteners: Limits and qualitative detection of non-nutritive artificial sweeteners such as aspartame, saccharin, acesulfame-K, and cyclamates.	Hydrocyanic acid	Parameters Tested: Added water, starch, urea, detergents, synthetic colors, and foreign fats.	Indicator Organisms: Includes Total Coliforms, Escherichia coli (E. coli), and Enterococci, which signal potential fecal contamination or poor sanitation.
Total Fat		Standardization and assaying of specific marker compounds, amino acids, fatty acids (SFA, MUFA, PUFA, Omega 3), and plant-based Heavy Metals: Testing for toxic elements including Lead (Pb), Arsenic (As), Cadmium (Cd), and Mercury (Hg) to ensure the absence of harmful pathogens such as Salmonella, Listeria	Synthetic Pyrethroids: Permethrin, Cypermethrin, and Deltamethrin.	Cadmium (Cd)	Fortificants: Specific tests are conducted to check that products mandated for fortification (like edible oil, milk, wheat flour, and rice) meet FSSAI's precise minimum and maximum limits for Iron, Folic Acid, and Vitamin B12	Butyric acid C4:0	Other Mycotoxins: toxins like Patulin (found in apples/apple juice) and Deoxynivalenol (DON) (common in grains)	Total Plate Count (TPC) / Aerobic Plate Count	Colors: Identification and estimation of permitted natural and synthetic food colors. Testing also checks for the illegal presence of restricted or toxic oil-soluble dyes (e.g., Sudan Red in sauces and oils). Antioxidants: Quantitative and qualitative determination of preservatives like BHA, BHT, and gallates.	Agaric acid	Lactometer readings for density; chemical tests (like Iodine or Silver Nitrate tests) to detect heavy starch, urea, and detergents. For ghee, High-Performance Liquid Chromatography (HPLC) detects vegetable fat adulterants.	Specific Pathogens: Tests for harmful bacteria such as Salmonella spp., Listeria monocytogenes, Vibrio cholerae, Bacillus cereus, and Clostridium perfringens.
Carbohydrate		monocytogenes, E. coli, Staphylococcus aureus, and limits for Total Plate Count (TPC), yeasts, and molds	Carbamates: Carbaryl, Carbofuran, and Methomyl.	Mercury (Hg) & Methyl Mercury		Caproic/Caprylic/Capric acids C6:0 to C10:0		Yeast and Mold Count		Other Toxins:	2. Spices and Condiments	Yeast and Mold: Evaluates spoilage in dairy, bakery, and dried products
Sugars			Herbicides & Fungicides: Glyphosate, Atrazine, and Hexaconazole. Fungiguns: Ethylene Oxide and its derivative 2-Chloroethanol (often tested in spices and dry commodities)	Copper (Cu)		Lauric Acid C12:0		Pathogens: E. coli, Salmonella, Listeria monocytogenes, Staphylococcus aureus		Paraffin (typically in fruit and apple products)	Parameters Tested: Artificial dyes (e.g., Rhodamine B, Metanil yellow), foreign starches, and cheaper substitutes (e.g., papaya seeds in black pepper, exhausted cloves).	
Dietary Fiber				Tin (Sn) (especially in canned foods)		Myristic Acid C14:0		Coliforms [1, 2, 3]		Hypericin	Testing Methods: Water-suspension tests to watch for unnatural dye leaching; chemical reagents (like hydrochloric acid) for color reactions.	
Sodium				Zinc (Zn)		Palmitic Acid C16:0		2. Chemical Parameters		Saffrole	3. Oils and Fats	
Saturated Fatty Acids				Chromium (Cr)		Stearic Acid C18:0		Monitors degradation, nutritional stability, and oxidative rancidity. [1, 2]		Deoxynivalenol	Parameters Tested: Argemone oil, mineral oils, rancidity, and blending with cheaper, unpermitted oils. Testing Methods: Saponification value, Iodine value, and specific thin-layer chromatography (TLC) to pinpoint harmful toxic oils like Argemone	
Monounsaturated Fatty Acids (MUFA)				Nickel (Ni)		Arachidic/Behenic/Linoleic acids C20:0 to C24:0		pH and Acidity (including alcoholic acidity)				
Polyunsaturated Fatty Acids (PUFA)						2. Unsaturated Fatty Acids (UFAs) Tests map the presence and ratio of monounsaturated fatty acids (MUFAs) and polyunsaturated fatty acids (PUFAs): MUFAs: Palmitoleic acid C16:1, Oleic acid C18:1, Eicosenoic acid C20:1 PUFAs: Linoleic acid C18:2, Linolenic acid C18:3		Moisture Content and Water Activity (a_w)				
Trans-fatty Acids						3. Detection of Trans-Fatty Acids (TFAs) Tests measure the composition of trans-isomers (like elaidic acid, C18:1 trans) to ensure		Peroxide Value (PV) and Free Fatty Acids (FFA) for lipid oxidation				
Cholesterol						4. Adulteration and Purity Markers specific tests via GLC to trace unusual fatty acids: Fat: Microscopic examination of fat crystals and separation of cholesterol using Reversed-Phase Thin Layer Chromatography (TLC) to detect animal fats in Triglyceride Profiling: Evaluates the structure of fat molecules		Protein and Vitamin degradation (where applicable) [1, 2, 3]				
Potassium								3. Sensory/Organoleptic Attributes				
Iron								Determines consumer acceptability and detects early stages of spoilage. [1, 2]				
Calcium								Taste, Flavor, and Aroma				
Vitamins								Color and Texture/Consistency [1, 2]				
								4. Packaging Compatibility				
								Tests the interaction between the food product and its packaging material				