

Product Testing

Types of Tests

- **Chemical**
 - Food composition
 - Food quality/stability
 - Food safety
- **Microbiological** – pathogens and spoilage
- **Physical**
 - Structure
 - Functionality

Chemical Tests – General Compositional

- Proximate analysis (Moisture, crude lipid, total ash, protein nitrogen). May also include (crude) rather than total dietary fiber
- Calculate total carbohydrate (sometimes measure simple sugars separately)
- Calculate total calories

Chemical Tests – Nutrient Content

- Nutrient analysis - vitamins and minerals.
- Total dietary fiber,
- Total fat & fatty acid profile (PUFA, saturated fat, trans fatty acids)
- Cholesterol

- Calories per serving (4-carbs 4-protein 9-fat)
- Calories from fat
- Amount of:

fat saturated fat

trans fat

cholesterol

sodium

total carbohydrate, dietary fiber,
sugar

protein

vitamin A vitamin C

calcium iron

- Vitamins required or permitted in standardized food
- e.g. thiamin, riboflavin, niacin in enriched flour
- Folate in enriched foods (health claims)

Voluntary components

- PUFA
- MUFA
- Potassium
- Soluble fiber
- Insoluble fiber
- Sugar alcohol
- Other carbohydrate

Voluntary components

- Vitamin D,E,K
- Thiamin
- Riboflavin
- Niacin
- B6
- Folate
- B12,
- Biotin
- Pantothenic acid
- Phosphorus
- Iodine
- Magnesium
- Zinc
- Selenium
- Copper
- Manganese
- Chromium
- Molybdenum
- Chloride

Chemical Tests – Food Safety

- Toxicological (natural toxins – aflatoxin, patulin)
- Heavy metals (lead, mercury)
- Pesticide residues
- Dioxin

Food Quality Analyses

- pH (also food safety)
- Flavor attributes (sugar, flavor, enhancers)
- Bioactive components
- Stability – oxidative stability/rancidity
 - Browning
 - Water activity/hygroscopic tendencies

Microbiological

- Total aerobic plate counts
- Yeast and mold
- Pathogens
- Spore germination and survival
- Process validation (thermal and high pressure processes)

Physical Tests

- Functional properties –spread, flow/resistance to flow, volume displacement
- Osmotic pressure (freezing point depression)
- Cell/tissue structure –microscopy (SEM)
- Force/deformation tests
 - Rheological tests – viscosity
 - Amylograph – change in viscosity with time and temperature
 - Texture analysis – puncture, shear, compression