

Factsheet on SFA's National Centre for Food Science (NCFS)

The National Centre for Food Science (NCFS) is the scientific arm of SFA and the cornerstone of SFA's integrated food safety programme. As the national reference laboratory for food science, NCFS plays a crucial role in upholding food safety by providing scientific expertise and performing in-depth applied research, risk assessment studies, data analytics, and laboratory diagnosis. It also provides testing services to support the investigation of foodborne disease outbreaks, and constantly strives to further develop advanced laboratory capabilities to counter threats from emerging hazards.

In October 2022, NCFS has relocated from Perahu Road and Outram Road to its new premises at the International Business Park. The strategic consolidation of both food laboratories into a single location streamlines operations, improves accessibility for inspectors to submit samples for testing, and provides greater accessibility for external collaborations and industry partnerships.

"This new facility with sustainability in the design, is housed with cutting-edge technologies, bringing together a multidisciplinary team of experts to provide monitoring, expert assessment, research and reference activities locally and internationally, to advance our mission to ensure food safety in Singapore." says Adjunct Associate Professor, Chan Sheot Harn, Centre Director, National Centre for Food Science, Singapore Food Agency.

About SFA's multi-disciplinary team and laboratory testing capabilities

SFA adopts a risk-based approach to food safety, guided by a science-based risk assessment and management approach that is consistent with international standards. SFA's multi-disciplinary team of competent and dedicated scientists from the National Centre for Food Science carries out a wide range of food safety testing, in the field of organic chemistry, inorganic chemistry and molecular & microbiology, such as food poisoning and spoilage organisms, harmful chemicals such as drug and pesticide residues, and foodborne toxins amongst others (Annex A).

Through the providing of scientific expertise and support, NCFS plays a pivotal role in upholding SFA's vision of "Safe Food for All" and the mission to ensure and secure a supply of safe food in Singapore.

The team at NCFS works closely with other divisions in SFA by providing scientific expertise and support to execute follow up actions during food safety incidents, such as enforcement, suspension of potential contamination sources, and food recalls.

Annex A:

NCFS carries out a wide range of laboratory analysis, in the field of organic chemistry, inorganic chemistry and molecular & microbiology.

Broad Area / Group	Specialisation	Food safety testing capabilities
Organic Chemistry	Drug & Residues	Test for residues of antibiotics, banned drugs and growth promoters in meat, fish, dairy and egg products, as well as animal feed.
	Pesticide Residues	Screen vegetables, fruits, meat, fish, dairy, grains, water and other processed food for a broad range of pesticides, fungicides, insecticides, herbicides and growth regulators, to ensure that samples do not exceed the maximum residue limit (MRL), as long-term ingestion of excessive pesticide residues could lead to adverse health effects.
	Foodborne & Natural Toxins	Screen and detect toxins in food and animal feedstuff for import control and export health certification, including: i. Mycotoxins (e.g. aflatoxins) in grains, nuts, milk and apple juice; ii. Marine biotoxins in fish and shellfish; iii. Bacterial toxins in food iv. Natural toxicants or allergens such as histamine in scombroid fish.
	Food Contact Material	Test for heavy metals, plasticizers, bleaching agents, mineral oils in food products, which have been migrated and leached from food packaging.
	Organic Contaminants	Test food for environmental pollutants (e.g. per- and polyfluoroalkyl substances (PFAS), polychlorinated biphenyls (PCBs) and dioxins) and harmful process contaminants (e.g. acrylamide, nitrosamines, polycyclic aromatic hydrocarbons, 3-MCPD esters and glycidyl esters) that are inevitably formed during food processing.
Inorganic Chemistry	Food Radioactivity	Monitors the background radioactivity levels for a range of food items (such as water, eggs, vegetables, milk, fruits, seafood, seaweed, sea salts, meats, processed foods), focuses on major artificial radionuclides (e.g., Alpha, Beta and Gamma-emitting radionuclides) that could pose health concerns.

	Inorganic Contaminants	Test for heavy metals (e.g., mercury, lead, arsenic, and cadmium in food (e.g., seafood), to reduce consumer's exposure to these contaminants.
	Food additives	Test for food additives such as chemical preservatives (e.g., benzoic acid, sorbic acid) to ensure that permitted substances are within the regulatory limits and non-permitted substances (e.g., illegal dyes) are not present.
	Food allergen	Conduct allergen testing to detect the presence of undeclared food allergens (e.g. milk, eggs, wheat, tree nuts), as allergen in food (e.g. gluten) could result in allergic reaction in individuals who are sensitive to it.
Microbiology and Molecular Biology	Food Microbiology	Conduct microbiological examinations of fresh and processed meat, seafood, dairy, other primary produce, processed food and water for food safety, covering foodborne pathogens (e.g. <i>Salmonella Enteritis</i>, <i>E. coli</i> 0157:H7, <i>Listeria monocytogenes</i>, <i>Vibrio</i>), Enterobacteriaceae hygiene indicators, foodborne parasites (e.g. <i>Cryptosporidium</i>, <i>Anisakis</i> spp). Conduct foodborne bacterial genomic profiling and characterization (e.g. serotype, sequence type, toxin/virulent markers, antimicrobial resistance genes) for effective investigations of outbreaks of foodborne illness and understanding of the prevalence of bacterial antimicrobial resistance in AMR monitoring program.
	Food Virology	Conduct testing for foodborne viruses such as norovirus, rotavirus, Hepatitis A & E on food (e.g. RTE food, oysters) to facilitate timely mitigation and ensure food safety.
	Bioengineering	Conduct species identification of raw and processed meat, and fish to ensure food authenticity and prevent illegal imports of food and food fraud. Conduct testing to check on food with unapproved genetic modified organisms in the retail market.