

Establishing a laboratory for monitoring pesticide residues and organic pollutants in Lebanon

The challenge...

The Lebanese Atomic Energy Commission (LAEC), at the National Council for Scientific Research, was designated as the reference centre for environmental monitoring and national food safety. LAEC was mandated to provide and apply methods for the analysis of residues, pollutants and contaminants in air, water and food and to upgrade its Environmental and Food Analysis Laboratory for this purpose. Although the laboratory was already equipped with some analytical devices for the determination of organic pollutants, it needed additional analytical equipment and staff training to allow it to extend its scope to the analysis of active ingredients used in agriculture and the food industry (pesticides, hormones, antibiotics, etc.), in line with current international standards.

The project...

An IAEA technical cooperation project aimed to upgrade the laboratory in order to increase its capacity to meet the demands placed on it, and to allow the laboratory to conduct analyses of a broad spectrum of food, drug and other environmental samples. Expertise and training were provided in several areas, including: an overview of different methods of trace analysis of food and environmental contaminants; sampling and sample preparation for pesticide residue analysis; and the development of analytical methods for determining heavy metals in different matrices. The laboratory was upgraded with the installation of a high performance liquid chromatography system and operator training, among other necessary items.



Sample preparation and analysis of organic pollutants.

The impact...

As a result of the project, national food and environmental safety has been strengthened in Lebanon. Compliance with the quality requirements for export has meant that market opportunities for Lebanese agricultural commodities have improved.

The number of samples analysed per year has tripled over five years, and research and development activities have led to the implementation of numerous analytical methods for the determination of organic contaminants/pollutants and heavy metals in food and the environment. Fellowship training has increased the capacity of national scientists and technicians, helping the laboratory to strengthen staff capabilities to perform the state of the art testing required for proper food safety and surveillance. The trust of customers in laboratory results and the recognition of quality and reliability have facilitated import and export of agricultural products at more attractive prices, leading to higher income in agricultural production and trade.

The laboratory's quality of work and analysis has been demonstrated through its participation in international proficiency testing (PT) schemes, with highly satisfactory results. PT schemes are very important prerequisites for international laboratory accreditation and recognition of laboratory performance. A quality control and quality assurance system was also implemented in the laboratory, leading to accreditation according to international standard ISO 17025.