

Food Testing Equipments

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The food testing industry has evolved over the years due to innumerable factors and experts forecast that this trend will continue in a robust fashion in the foreseeable future. The food safety testing market is projected to grow from US\$17.0 billion in 2018 to US\$24.6 billion by 2023, at a CAGR of 7.7% during the forecast period.

The main reasons for the growth of the industry are foodborne diseases caused owing to the presence of food contaminants coupled with stringent regulatory norms. Also, the major influencing element is the growing awareness amongst the consumers for safe and hygienic food in the market. The high competition between the leading brands and the incidences of food frauds globally, coupled with an increase in technology and packaged food products have accelerated their growth.

Strengthening of infrastructure

The food testing infrastructure in India is escalating with the help of different reforms by the government. FSSAI has lately strengthened the infrastructure by upgrading food testing laboratories with an investment of Rs 482 crore.

The labs will be more efficient, reliable, and automated with recent technologies. Under this scheme, FSSAI will be enabling referral food testing lab to obtain NABL accreditation. Besides, 62 mobile testing labs will be launched across all states.

From simple visual inspections and chemical analyses to microbial assays and culturing techniques, food quality assurance has come a long way. The latter are older, more importantly, time-consuming methods. As multi-step processes, with prolonged incubation periods, they amplify opportunities for human error. These methodologies may soon be supplanted by speedy assays capable of detecting pathogens quickly and definitively so that public health officials can intervene swiftly when necessary.

Examples of more sophisticated, far more rapid (yet also more expensive) testing methods include the polymerase chain reaction and immunoassay-based techniques. These assays can be performed in a matter of hours, helping to identify potential pathogens in the food chain in a timely manner.

Detection of mycotoxins

Rapid-analysis technologies are continuously improving. For example, a recently described refinement to venerable technology excels at detecting mycotoxins in maize samples. Chinese researchers have announced the development of a multi-wavelength fluorescence polarisation immunoassay for the multiplexed detection of mycotoxins.

Investigators report successful identification of naturally contaminated maize samples within 30 minutes, including sample preparation.

In another example, scientists at the State University of New York at Binghamton recently published research detailing the development of an autonomous microbial cell culture and classification system for the rapid detection of food pathogens. The system is reportedly capable of correctly identifying various strains of pathogenic *Escherichia coli* and *Staphylococcus epidermidis* in samples—in less time than the industry standard of 24 hours.

Bioelectric tongues

Other examples of new and emerging food safety technologies include biosensors, such as the “bio electric tongue.” As noted in a recent scientific journal article, “Bio electronic tongues provide superior performance by combining the capabilities of electronic tongues to derive meaning from complex or imprecise data, and the high selectivity and specificity of biosensors.” This technology is expected to enhance food safety testing by facilitating rapid testing combined with high sensitivity and appropriate selectivity. Bioelectric tongues are promoted as especially promising tools for screening analysis.

With contrary to having huge labs, in today's time, space is considered to be a premium. The future labs will be smaller to promote space savings. The size of the equipment will be smaller as compared to the older ones and will be driven by a laptop. However, a dedicated facility with specialised air handling system can be required for specific pathogens to avoid cross-contamination.

Test-kits and instruments

Data handling and interpretation can be all the more convenient and time-saving with the advent of user-friendly test-kits and instruments. In-house testing can be implemented by the companies rather than outsourcing it to other labs. A lot of new equipment have been introduced in several companies to ease the testing process. Tremendous growth has been witnessed with the advent of new technology in the labs. Faster results, appropriate tests, minute detection and so on.

The laboratories have the responsibility to conform to the recent regulations introduced by FSSAI every now and then. FSSAI comes up with the regulations that pace the functioning of lab activities. This ultimately benefits the end-consumers who have been waiting for the test results. The food-borne diseases have taken a toll which has also questioned the authorities on its genuinity.

Food testing has yet to see a lot of developments in the coming future. With strict competition around food safety issues, food testing industry will be challenged at every step to grow better and overcome the uncertainties.