ROLE OF FOOD TESTING LABORATORIES FOR ASSURING FOOD SAFETY IN INDIA

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Food testing laboratories

Food testing laboratories play a critical role in detecting contaminations at various stages in the farm-to-table process and assist various stakeholders directly or indirectly in eliminating unsafe food from the supply chain.
Food safety concerns – Historical trends

1960 – 70s
- Toxic metals
- Microbial contamination

1980 – 90s
- Pesticide residues at milligram level
  eg. Organochloro

1990 – 2000
- Pesticide residues at microgram level for multiple residues

2000 onwards
- Dioxins & precursors
- Toxins

2005 onwards
- Pesticide residues at microgram level for hundreds of residues
- Drug residues

2010 onwards
- Microbial flora identification,
  Viral testing, Peptide profiling, Allergens, Enzyme analyses

2015 onwards
- Pesticide & drug residues at nano/sub nano levels
Successful implementation helps laboratories to improve efficiencies and capture the knowledge and experience into the system.
Good food laboratory practice

It’s all about Quality and integrity of data!
Key elements of a laboratory operation that impact data and its integrity

- Training and proficiency of analyst – who handles food samples, prepares reagents, operates analytical equipment, calculates and documents analytical data.

- Sample integrity – sampling process and sample handling according to established procedures. Correct and accurate labeling and identification (verification). Sample storage under defined conditions (pre, post & during testing).

- Integrity of reagents and their traceability.
Key elements...

- Test equipment – validity per intended usage, calibrations and preventive maintenance.
Historical trends in laboratory instrumentation

1970-80s: Microprocessor based test equipment

1980-2000: Stand alone computerized Analytical Instrumentation, LIMS


2016+: Client server network analytical instruments. Paperless Lab Solutions
Computerized systems

Computerized systems need management controls and security features for ensuring data integrity:

- Assign and maintain access rights and privileges.
- Electronic signatures specific to authorized individuals, audit trails established and activated.
- Periodic data backup and verification.
- Archival of data and record retention along with recovery and contingency plans.
- Defined and controlled process for any modification to electronic/data records.
Data

Increasing computerization in testing laboratory environment is generating voluminous data and it is a big challenge globally to all the stakeholders to ensure the attributes of “DATA” generated.
Data

- Data is defined as *facts* that can exist in a variety of forms such as *numbers or text on paper or bits and bytes in electronic form*. In a laboratory the facts exist as *raw data*, on *paper* or as *electronic data*. The result of original observations, measurements and activities which are necessary for reconstruction and evaluation of a test result or project/study report form the raw data.

*What, Who and When??*
Data integrity

- *Data integrity* is a condition which exists when data is unchanged from its source and has not been accidentally or maliciously modified, altered or destroyed.

- Put simply, data integrity is the assurance that data is consistent, accurate, reliable, accessible and complete. This further assures that the test report generated by a testing laboratory is accurate.
Key elements of a laboratory operation that impact data and its integrity

- Standard / validated test methods
- Good documentation practices
- OOS / OOT, repeat analysis
- Test reports
- Laboratory design and environmental conditions
Emerging trends

- Green-technologies & Chemistry
- Growing demand for rapid microbial testing
- Allergen tests
- Scientific evaluation of processed foods shelf-life
Big challenge

Ever growing rate of technological obsolescence!
Conclusion

Uphold Quality and Integrity of data in your operations, that leads to professional satisfaction, protection of your reputation and serves the cause of food safety.
Thank you!