

## Food Forensic

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### SUMMARY

Food fraud in terms of adulteration is a growing problem in India. Forensic Science is the application of scientific principles and technological practices to the purposes of justice in the study and resolution of criminal, civil, and regulation issues. Food Safety Forensics is the methodology of using food safety principles, detection methods and processes to solve crimes, or to verify and document food poisoning or adulteration for both humans and pets. It is specific to food micro-organism poisoning, and represents a disciplined methodology for identifying the food poisoning cause and contributing factors, and identifies a sequential "tracking and tracing" investigative steps, technologies, and detection tools. Food forensics is an emerging branch of forensic chemistry which comes to rescue when food is contaminated or adulterated. It helps to check food safety and quality amongst others.

### INTRODUCTION

Forensic Science, also known as criminalistics, is the application of science to criminal and civil laws, mainly on the criminal side during criminal investigation, as governed by the legal standards of admissible evidence and criminal procedure. The word *forensic* comes from the Latin term '*forensis*', meaning "of or before the forum". The history of the term originates in Roman times, when a criminal charge meant presenting the case before a group of public individuals in the forum. The term is so closely associated with the scientific field that many dictionaries include the meaning that equates the word *forensics* with *forensic science*. In 1993, the Board of Directors of the American Academy of Forensic Sciences (AAFS) partitioned Forensic Science into 11 categories and Food Science and Food Safety are not among them - even though food is ingested into the body, and the fields of food science and food safety have not been recognized. But that is expected since food science and food safety forensics are among the emerging fields of related forensic sciences.

#### Forensic Science Field:

- Forensic anthropology
- Forensic engineering
- Forensic odontology
- Forensic pathology
- Forensic entomology
- Toxicology

#### How does food forensics differ from other forensic sciences?

**Food Safety Forensics differs from the other nine forensic sciences in the following ways:**

- Food, like pharmaceutical drugs, is ingested into the human body.
- Food is a matter of life and death.
- Food is perishable with a short shelf-life and its "fingerprints" vanish.
- Food Safety Forensics uses multiple methodologies from the other forensic sciences.
- Food Safety Forensics methodology must track through the entire "farm-to-fork" supply Chain.

#### What is food safety forensic?

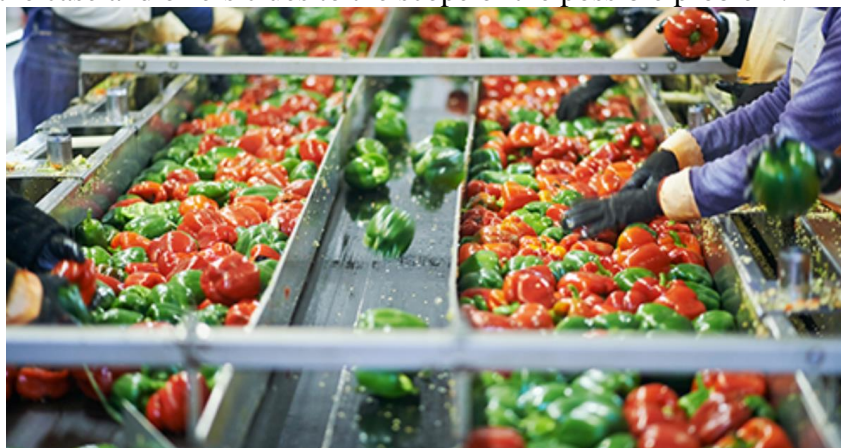
Forensic science is increasingly being used to investigate and solve crimes. The science involved in criminal forensics is also being applied to the investigation of food quality problems and food safety issues. Companies undertake food forensic investigations for many reasons, such as to identify problems that may have affected the quality and safety of their products, to respond to consumer complaints or problems found in routine quality control testing, and to protect the company's reputation and liability. The problems may involve the presence of foreign materials and contaminants in raw materials and finished products; off-odors, off-flavors, and

appearance problems; microbial spoilage, foodborne illness, and intentional adulteration to cause harm or to defraud for financial gain.



**Fig 1. Appearance problem of Food**

The U.S. Food and Drug Administration (FDA) has issued a final rule requiring food companies to develop mitigation strategies to protect food against Intentional adulteration, as required by the Food Safety Modernization Act. The rule is aimed at preventing Intentional adulteration intended to cause widespread harm to public health, including acts of terrorism targeting the food supply. It does not cover economically motivated adulteration (EMA), but EMA is addressed in the FDA's final rules on preventive controls for human and animal foods. Forensic environmental health deals with the relation and application of facts in sanitary science and public health to legal problems. In every foodborne illness in which damages are sought through the initiation of a lawsuit, there are several questions that always need to be answered: who, what, when, where, why, and most importantly, how? The answers are provided by a panel of experts who, according to the established Rules of Evidence, "assist the trier of fact" through their "scientific, technical, or other specialized knowledge." If the opinions are not based on reliable methodology they may not be of benefit to the trier of the case and in fact, may be disqualified. So, if any component is missing or unreliable, the case will not stand on its own merit. The attorney through the complaint and initiation of a lawsuit; this can encompass one person or a whole host of individuals along with impressions and details of the events that led to the foodborne misadventure along with an interpretation of the law. The "what?" is answered by the physician who makes a medical diagnosis of the foodborne illness with validation by laboratory confirmation. There is generally a detailed description of the illness, its severity and outcome. The laboratory work provides us with the identity of the responsible microbes, and if we are particularly lucky, the laboratory identification will also include species and strains. The epidemiologist identifies the food or foods involved and sorts out the all-important stochastic components of the food misadventure. Without this time component and cascade of events, the misadventure is wrong. The epidemiologist's analysis confirms the "what?" and "when?", and hopefully provides us with "where?". More importantly, it narrows the search and gives a scientific definition to the case and offers clues to the scope of the possible problem.



**Fig 2. Any damage problem of Food**

## CONCLUSION

Consumers need clear and accurate information so that they can make informed choices about their diet and the foods they buy. This choice might reflect lifestyle, economic or health concerns but, increasingly in our multicultural society, it can also reflect religious practices. Food safety refers to routines in the preparation, handling and storage of food meant to prevent foodborne illness and injury. From farm to factory to fork, food products may encounter any number of health hazards during their journey through the supply chain. Safe food handling practices and procedures are thus implemented at every stage of the food production life cycle in order to curb these risks and prevent harm to consumers.

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