

Human and Animal Food Laboratory Professionals-Entry

E-1 Accreditation/Certification

Definition: The process by which an authoritative body gives formal recognition that an organization is competent to carry out specific tasks (accreditation)/a process by which a third party give written assurance that a service or person conforms to specified requirements (certification).

Level 2: Perform job duties consistent with the quality management system.

Level 3:

- Communication
 - Describe the quality management system.
- Leadership
 - Explain how lab activities support the quality management system.
- Programmatic
 - Follow the requirements of the quality management system.
- Technical
 - Apply knowledge of accreditation requirements when performing analytical work.

Foundations

Definition: Foundational knowledge related to the accreditation and certification processes.

Level 4: Discuss the purpose of quality oversight programs

Level 5:

- Describe accreditation.
- Explain ISO/IEC17025.
- Explain the importance of a standard.
- Describe scope of accreditation.
- Explain the relationship between accreditation and a quality management system.
- Describe certification.
- Give examples of certification programs applicable to food testing.

Accreditation/Certification Process

Definition: The steps required to attain and maintain accreditation/certification.

Level 4: Discuss the accreditation/certification process.

Level 5:

- Describe how a lab acquires accreditation/certification.
- Describe how a lab maintains accreditation/certification.
- Identify their accreditation/certification body.
- Summarize what to expect during an on-site assessment.

Human and Animal Food Laboratory Professionals-Entry

E-2 Basic Communication Skills

Definition: Ability to effectively and appropriately interact with others in order to achieve desired goals.

Level 2: Exchange information.

Level 3:

- Communication
 - Level 3 competency for communication domain of basic communication skills is not required.
- Leadership
 - Collaborate with others.
- Programmatic
 - Describe laboratory communication policies.
- Technical
 - Implement laboratory policies and processes.

Basic Communication Elements

Definition: Skills and concepts used to convey information.

Level 4: Apply communication principles.

Level 5:

- Select mode of communication.
- Adapt communication to audience.
- Perform active listening.
- Recognize the effect of non-verbal communication.
- Differentiate fact from opinion.

Professionalism

Definition: Communication conduct expected from the laboratory professional.

Level 4: Convey professionalism.

Level 5:

- Recognize when to communicate opinion.
- Incorporate constructive feedback.
- Express constructive feedback.
- Express honesty.
- Show respect for others.
- Demonstrate objectivity.
- Demonstrate integrity.

Human and Animal Food Laboratory Professionals-Entry

Laboratory Communication Protocols

Definition: Communication rules that explain the correct conduct and procedures to be followed by laboratory professionals.

Level 4: Apply laboratory-specific communication policies.

Level 5:

- Comply with policies regarding internal laboratory communication.
- Comply with policies regarding communication with external sources.
- Comply with laboratory code of conduct.

Human and Animal Food Laboratory Professionals-Entry

E-3 Basic Laboratory Math

Definition: Math for analytical work.

Level 2: Apply mathematics to sample analysis.

Level 3:

- Communication
 - Explain mathematics used in the laboratory.
- Leadership
 - Review data for essential elements.
- Programmatic
 - Use appropriate measurements and calculations.
- Technical
 - Apply mathematics to analytical work.

Math Vocabulary Used in the Laboratory

Definition: Common mathematical terminology used in the laboratory.

Level 4: Describe laboratory math vocabulary.

Level 5:

- Recognize how symbols are used in a mathematical operation.
- Define key laboratory terminology.
- Explain how constants (pi, Avogadro's number) are used.

Basic Mathematical Concepts Used for Science

Definition: Laboratory calculations using basic mathematical concepts.

Level 4: Perform laboratory calculations using basic mathematical concepts.

Level 5:

- Apply order of operations to perform calculations.

Mathematical Applications for Laboratory Analysis

Definition: Commonly used mathematical applications for laboratory analyses.

Level 4: Demonstrate mathematical applications for laboratory analyses.

Level 5:

- Describe differences between various units of measure.
- Illustrate the use of significant figures.
- Perform unit conversion.
- Construct a formula.
- Diagram serial dilution scheme.

Human and Animal Food Laboratory Professionals-Entry

E-4 Basic Laboratory Statistics

Definition: Statistics for analytical work.

Level 2: Utilize statistics in analytical work.

Level 3:

- Communication
 - Describe basic statistics.
- Leadership
 - Discuss the application of basic statistics to analytical work.
- Programmatic
 - Use approved statistical tools.
- Technical
 - Apply appropriate statistical methods to obtain unbiased data.

Basic Statistical Concepts

Definition: Characterize data using fundamental statistics.

Level 4: Discuss basic statistical concepts used to characterize data.

Level 5:

- Describe the various distributions of data sets.
- Describe statistical parameters used to explain population distributions.
- Describe statistical parameters used to define variation in data sets.

Statistical Applications

Definition: Assessing the validity of results with statistics.

Level 4: Use statistics to assess the validity of results.

Level 5:

- Assess the linearity of standard curves.
- Assess method validation data.

Human and Animal Food Laboratory Professionals-Entry

E-5 Basic Laboratory Techniques

Definition: Basic tools, materials, and applications used for analytical work.

Level 2: Discuss basic laboratory techniques for analytical work.

Level 3:

- Communication
 - Explain basic techniques used in analytical work.
- Leadership
 - Determine the readiness of analytical tools/materials.
- Programmatic
 - Use approved laboratory techniques.
- Technical
 - Apply basic techniques to analytical work.

Quality Assurance

Definition: Basic elements of quality assurance related to testing performance.

Level 4: Discuss the basic elements of quality assurance related to testing performance.

Level 5:

- Describe the function of method controls.
- Recognize when traceability will be applied.
- Recognize the importance of SOPs.
- Recognize the need for root cause analysis for non-conforming work.
- Report deviations from specifications for lab supplies.
- Differentiate the functions for various types of labware.

Pre-analytical

Definition: Practices to prepare for testing.

Level 4: Describe practices to prepare for testing.

Level 5:

- Explain the purpose of preventing cross contamination.
- Describe the process of sample flow.

Laboratory Techniques

Definition: Basic skills required in the laboratory setting.

Level 4: Apply the basic skills required in the laboratory setting.

Level 5:

- Perform basic equipment calibration.
- Apply basic computer skills.
- Explain reagent specification requirements.
- Differentiate the properties of various filters.
- Describe the types of general laboratory equipment.
- Describe the types of sample preparation equipment.

Human and Animal Food Laboratory Professionals-Entry

E-6 Chain of Custody

Definition: Procedures for formal chronological documentation that records the sequence of collection, custody control, transfer, receipt, analysis, and disposition of samples.

Level 2: Apply knowledge to control samples in a manner that maintains sample integrity and sample security.

Level 3:

- Communication
 - Describe the reasons for maintaining sample integrity and sample security.
- Leadership
 - Demonstrate actions to maintain chain of custody.
- Programmatic
 - Describe laboratory policies and procedures for sample chain of custody.
- Technical
 - Apply protocols to maintain sample integrity, traceability, and security.

The Purpose of Chain of Custody

Definition: The role of chain of custody in maintaining evidentiary integrity.

Level 4: Discuss the role of chain of custody in maintaining evidentiary integrity.

Level 5:

- Explain the importance of chain of custody in legal proceedings.
- Explain the importance of chain of custody in supporting regulatory enforcement actions.

Traceability

Definition: The ability to verify the history, location, or possession of a laboratory sample by means of documentation or record.

Level 4: Discuss the role of chain of custody in retracing the custody of the sample.

Level 5:

- Describe how traceability is essential to support regulatory action.
- Describe how documentation is used as evidence in chain of custody.
- Describe steps for sample disposal.

Human and Animal Food Laboratory Professionals-Entry**Sample Integrity**

Definition: The methods used to ensure physical and analyte integrity.

Level 4: Describe how integrity is maintained.

Level 5:

- Discuss appropriate storage attributes to maintain sample integrity.
- Discuss ways to assess sample integrity.

Sample Security

Definition: The practices used to limit access to samples.

Level 4: Describe how access to samples is limited.

Level 5:

- Discuss maintaining sample security.
- Give examples of measures to limit access to samples.

Human and Animal Food Laboratory Professionals-Entry

E-7 Ethics

Definition: Practices governing the conduct of an individual.

Level 2: Apply ethical principles.

Level 3:

- Communication
 - Describe ethics.
- Leadership
 - Discuss ethical principles in the workplace.
- Programmatic
 - Discuss policies and procedures related to ethical behavior.
- Technical
 - Apply scientific integrity in the production of test results.

Organizational Code of Conduct

Definition: The policies used to describe expected behaviors in organizational members.

Level 4: Describe the role of code of conduct for people working in a regulatory laboratory.

Level 5:

- Discuss the purpose of a code of conduct.
- Discuss elements of a code of conduct.

Personal Behavior

Definition: The personal values that influence behavior in the workplace.

Level 4: Discuss the impact of personal behavior.

Level 5:

- Describe credibility as it relates to sample results.
- Give examples of positive ethical attributes.

Ethical Challenges

Definition: Personal behaviors that can have a negative impact upon laboratories.

Level 4: Discuss ethical challenges faced by laboratories.

Level 5:

- Give examples of ethical challenges faced by laboratories.
- Discuss the importance of maintaining impartiality in support of the rule of law.
- Describe how public perception can impact an organization's credibility.
- Describe how personal behaviors impact scientific integrity in the production of test results.

Human and Animal Food Laboratory Professionals-Entry

E-8 Incident Command System (ICS)

Definition: The systematic tool used for the command, control, and coordination of emergency response.

Level 2: Explain ICS principles during emergency response and recovery.

Level 3:

- Communication
 - Describe ICS.
- Leadership
 - Discuss roles of laboratories in ICS.
- Programmatic
 - Apply ICS principles.
- Technical
 - Operate within the ICS.

National Incident Management System (NIMS)

Definition: An overview of the National Incident Management System (NIMS) and the role of the laboratory in managing incidents.

Level 4: Describe NIMS.

Level 5:

- Define NIMS.
- Describe the role of the laboratory in the NIMS.

Incident Command System

Definition: An overview of the Incident Command System (ICS).

Level 4: Explain the ICS.

Level 5:

- Describe the features and principles of ICS.
- Describe the five functional areas in an ICS structure.
- Describe the incident commander and command staff functions.
- Give examples of when ICS is used.

The Laboratorian Role in ICS

Definition: The role of laboratorians in ICS.

Level 4: Describe how laboratorians may be involved in ICS.

Level 5:

- Describe the role of the laboratory in an incident.
- Give examples of activities a laboratorian may be asked to do in an incident.

Human and Animal Food Laboratory Professionals-Entry

E-9 Integrated Food Safety System (IFSS)

Definition: Introductory knowledge related to the concept of a national collaborative and cooperative network of federal, state, local, tribal, and territorial human and animal food protection agencies working in concert to protect the U.S. human and animal food supply.

Level 2: Describe how the Integrated Food Safety System (IFSS) protects public health.

Level 3:

- Communication
 - Explain the purpose of the IFSS.
- Leadership
 - Support the IFSS.
- Programmatic
 - List stakeholder roles in the IFSS.
- Technical
 - Describe laboratory contributions to the IFSS.

Overview of the IFSS Concept

Definition: A collaborative of food safety stakeholders.

Level 4: Discuss the role of the laboratory within the IFSS.

Level 5:

- Distinguish regulatory roles in a global environment.
- Describe existing lab networks which contribute to IFSS.

E-10 Laboratory Information Management System (LIMS)

Definition: A software-based system that processes, stores and manages data in support of laboratory operations.

Level 2: Explain the importance of LIMS.

Level 3:

- Communication
 - Describe basic functions of LIMS.
- Leadership
 - Report LIMS issues.
- Programmatic
 - Describe the role of LIMS.
- Technical
 - Use LIMS.

Foundations

Definition: Foundational knowledge related to electronic data management.

Level 4: Discuss elements of electronic data.

Level 5:

- Define electronic data.
- Identify sources of electronic data.
- Describe how electronic data is used.

Capabilities of LIMS

Definition: Features of a LIMS.

Level 4: Describe the importance of a LIMS.

Level 5:

- Describe the purpose of a LIMS.
- List important features of a LIMS.
- Discuss interactions with other applications/instruments.

LIMS Administration

Definition: Administration of a LIMS.

Level 4: Describe LIMS administration in laboratory operations.

Level 5:

- Discuss the role of a LIMS administrator.
- Discuss LIMS administration tasks.

Human and Animal Food Laboratory Professionals-Entry

E-11 Method Resources

Definition: Sources of analytical methods.

Level 2: Explain why recognized methods are used.

Level 3:

- Communication
 - Explain where to find recognized methods.
- Leadership
 - Identify fit for purpose analytical methods.
- Programmatic
 - Explain the importance of recognized methods in regulatory analytical work.
- Technical
 - Apply fit for purpose analytical methods.

Foundations

Definition: Foundational knowledge related to analytical testing in the laboratory.

Level 4: Describe foundational knowledge related to analytical testing.

Level 5:

- Define recognized methods.
- Identify sources of recognized methods.
- Discuss the importance of using recognized methods.
- Describe the importance of method validation.
- Describe the importance of method verification.

Method Selection

Definition: The process by which a laboratory determines suitable analytical methods.

Level 4: Discuss the process by which a laboratory determines suitable analytical methods.

Level 5:

- Define QMS terms related to methods.
- Describe criteria for methods selection.
- Identify fit for purpose method.
- Describe the reason for modification to a recognized method

Human and Animal Food Laboratory Professionals-Entry

E-12 Public Health Principles

Definition: The practices used to detect, prevent, and respond to illness and disease.

Level 2: Describe the role of public health stakeholders.

Level 3:

- Communication
 - Describe the laboratory role in public health.
- Leadership
 - Discuss the analyst's role in the protection of public health.
- Programmatic
 - Explain the importance of laboratory results to regulatory agencies.
- Technical
 - Produce analytical results for public health use.

Foundations

Definition: Foundational knowledge related to public health principles.

Level 4: Discuss foundational knowledge related to public health principles.

Level 5:

- Explain public health.
- Discuss the role of laboratories in public health.
- Illustrate how food safety is part of public health.
- Relate how human and animal food laboratories impact public health.

Laboratory and Public Health Agency Interaction

Definition: The relationship of laboratories and regulatory agencies when making public health decisions.

Level 4: Describe how laboratories interact with regulatory agencies.

Level 5:

- List the regulatory actions taken based on laboratory results.
- List the public health decisions made based on laboratory results.
- Define the proper procedures for reporting analytical results.
- Recognize the importance of maintaining legal defensibility.
- Define traceback.
- Define the role of surveillance in public health decisions.

Human and Animal Food Laboratory Professionals-Entry

Analyst

Definition: A person who analyzes human and animal food for the protection of public health.

Level 4: Describe a human and animal food analyst.

Level 5:

- Define the analyst's role in public health.
- Give examples of human and animal food contaminants.
- Give examples of analytical tests.
- Illustrate analyst competency.

Outbreak

Definition: Multiple cases of illness related to human and animal food contamination.

Level 4: Give examples of the importance of testing in human and animal food related events.

Level 5:

- Discuss the different types of outbreaks.
- Explain the importance of human and animal testing to prevent outbreaks.
- Explain the importance human and animal testing in an outbreak situation.

E-13 Quality Management Systems

Definition: The organizational framework that defines the quality policy, objectives, and procedures.

Level 2: Describe how analytical work falls within the parameters of a quality management system.

Level 3:

- Communication
 - Describe the laboratory's quality management system.
- Leadership
 - Explain quality management principles.
- Programmatic
 - Explain the importance of the quality management system.
- Technical
 - Apply quality management knowledge when performing analytical work.

Foundations

Definition: Foundational knowledge related to the quality management system.

Level 4: Explain laboratory quality management systems.

Level 5:

- Explain the importance of a quality management system.
- Identify the principles of a quality management system.
- Explain the relationship between accreditation and a quality management system.

Human and Animal Food Laboratory Professionals-Entry

Elements

Definition: Components of the quality management system.

Level 4:

Describe the components of the quality management system.

Level 5:

- Identify the importance of technical review.
- Apply document control requirements.
- Report non-conformance.
- Locate quality management documents.
- Describe training requirements for competency.
- Recognize the importance of the quality manual to the laboratory work.
- Describe the corrective action process.
- Identify the need for a root cause analysis.
- Describe the preventive action process.
- Describe the importance of quality control.
- Describe the internal audit process.
- Describe the use of a proficiency sample.
- Define traceability.
- Explain the importance of using validated methodology.
- Explain the importance of using calibrated equipment.
- Recognize the need to use only approved supplies.

Human and Animal Food Laboratory Professionals-Entry

E-14 Regulatory Programs

Definition: The regulatory framework and activities that ensure safe human and animal food.

Level 2: Describe the regulatory framework and activities that ensure safe human and animal food.

Level 3:

- Communication
 - Describe the regulatory programs supported by the laboratory.
- Leadership
 - Define regulatory program partners.
- Programmatic
 - Identify laboratory policies and procedures required to meet regulatory program needs.
- Technical
 - Explain how analytical work supports regulatory programs.

Regulatory Participants

Definition: The members of a regulatory system and their roles.

Level 4: Describe the participants in the regulatory system.

Level 5:

- Describe federal, state, local regulatory interactions.
- Identify framework stakeholders.
- Describe how various laboratories within the framework collaborate with each other.

Regulatory Activities

Definition: The primary functions performed by government human and animal food safety regulators.

Level 4: Discuss key regulatory activities.

Level 5:

- Identify the components of a regulatory system.
- Distinguish between surveillance inspection and compliance investigation.
- Explain the importance of evidence in enforcement action.
- Identify laboratorian role in the regulatory structure.

Human and Animal Food Laboratory Professionals-Entry

Legal Authorities and Limitations

Definition: The laws and regulations that define agency responsibilities and limitations.

Level 4: Explain legal authorities.

Level 5:

- Recognize the difference between interstate and intrastate commerce jurisdictions.
- Distinguish between statutes/laws/acts, rules/regulations, and policy.
- Define the basis of regulatory authority.

Stakeholder Outreach

Definition: The role of laboratory communication with stakeholders.

Level 4: Discuss stakeholder outreach.

Level 5:

- Recognize the role of the laboratory in public health.
- Explain how laboratory testing contributes to the education of stakeholders.

Laboratory Policies and Procedures

Definition: The authorities and processes that describe how laboratories function.

Level 4: Discuss laboratory policy and procedures.

Level 5:

- Explain important aspects of regulatory test methods.
- Explain how elements of sample testing support evidence development.
- Explain the importance of maintaining confidentiality of testing.

Human and Animal Food Laboratory Professionals-Entry

E-15 Regulatory Sampling

Definition: The reasons samples are collected in regulatory human and animal food programs.

Level 2: Describe the importance of human and animal food regulatory sampling.

Level 3:

- Communication
 - Describe the critical components of a sampling process.
- Leadership
 - Articulate condition of laboratory samples during receipt.
- Programmatic
 - Describe the importance of regulatory program quality criteria.
- Technical
 - Determine condition of the laboratory sample.

Sample Planning

Definition: The process regulatory programs use to establish sampling objectives.

Level 4: Discuss the relationship between the program and the laboratory to meet sampling objectives

Level 5:

- Differentiate regulatory program requirements.
- Discuss the capability and capacity required to accommodate a sampling plan
- Define a decision unit.
- Discuss the relationship between sampling data quality criteria and fit for purpose decisions.
- Identify sample retention requirements.

Sample Collection

Definition: Elements of the sample collection process.

Level 4: Discuss the sample collection process.

Level 5:

- Discuss the elements of sample collection.
- Discuss how to maintain sample integrity from collection to submission.

Sample Submission

Definition: How regulatory samples are provided to the laboratory.

Level 4: Explain the sample submission process.

Level 5:

- Discuss the process for assessing sample acceptability.
- Relate acceptance criteria to regulatory program quality requirements.
- Relate acceptance criteria to sample quality criteria.

Human and Animal Food Laboratory Professionals-Entry

E-16 Safety

Definition: The condition of being free from danger, risk, or injury.

Level 2: Describe safe laboratory practices.

Level 3:

- Communication
 - Explain safe laboratory practices.
- Leadership
 - Demonstrate safe laboratory practices.
- Programmatic
 - Explain the importance of safe laboratory practices.
- Technical
 - Apply safe laboratory practices.

Laboratory Safety

Definition: Foundational knowledge related to laboratory safety.

Level 4: Discuss laboratory safety.

Level 5:

- Explain general safety practices.
- Explain the emergency evacuation plan.
- Explain the main principles of a biosafety plan.
- Explain the main principles of a chemical hygiene plan.

Facility

Definition: The impact of building design on laboratory safety.

Level 4: Describe how the physical environment impacts safety.

Level 5:

- Discuss the elements of a floor plan.
- Describe the impact of utility outages.
- Discuss laboratory security measures.

Human and Animal Food Laboratory Professionals-Entry

Personal Protective Equipment (PPE)

Definition: Articles worn to protect laboratory personnel.

Level 4: Describe personal protective equipment.

Level 5:

- Explain the importance of PPE.
- Select PPE for function.
- Illustrate use of PPE.

Safety Tools

Definition: Tools designed to mitigate the effects of laboratory hazards.

Level 4: Describe laboratory safety tools.

Level 5:

- Explain the importance of safety tools.
- Select safety tools for function.
- Illustrate use of safety tools.

E-17 Laboratory Sampling**Definition:****Level 2:****Level 3:**

- Communication
- Leadership
- Programmatic
- Technical

Human and Animal Food Laboratory Professionals-Entry

E-18 Waste Management

Definition: The collection, transport, processing, disposal, and monitoring of laboratory waste materials.

Level 2: Explain laboratory waste management.

Level 3:

- Communication
 - Describe laboratory waste management procedures.
- Leadership
 - Report waste management concerns.
- Programmatic
 - Describe laboratory waste management requirements.
- Technical
 - Apply laboratory waste management procedures.

Foundations

Definition: Foundational knowledge related to the storage, treatment, transport, and disposal of biological and chemical waste.

Level 4: Describe waste stream in a laboratory.

Level 5:

- Discuss the importance of waste management.
- Describe biological waste management procedures.
- Describe chemical waste management procedures.
- Characterize waste.

Laws/Regulations

Definition: Legal and regulatory requirements related to waste management.

Level 4: Describe legal/regulatory requirements related to waste management.

Level 5:

- Describe the regulatory framework for waste management.
- Describe the importance of regulations in waste management.
- Explain the main waste management regulatory requirements.

Human and Animal Food Laboratory Professionals-Entry**Transportation/Storage**

Definition: Moving and holding biological and chemical waste.

Level 4: Describe the management of biological/chemical waste.

Level 5:

- Describe transportation of waste.
- Describe storage of waste.
- Label waste.
- Differentiate among waste streams.
- Recognize waste storage limits.
- Recognize authorized contractors.

Equipment/Supplies

Definition: Items and tools used in waste management.

Level 4: Give examples of items and tools used in waste management.

Level 5:

- Match the proper container to the type of waste.
- Identify PPE used in waste management.
- Describe disposal of contaminated PPE.
- Identify equipment used in waste management.
- Locate spill response equipment.