NATIONAL COUNCIL FOR TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING

APRIL 2023

PROPOSED OCCUPATIONAL STANDARDS

OCCUPATION: FOOD INSPECTION AND TESTING ENGINEER

LEVEL: NTA 7

TABLE OF CONTENT

CONTENTS

ABBREVIATIONS

CBET	Competency Based Education and Training
IEC	International Electrotechnical Commission
ISO	International Organization for Standardization
LIMS	Laboratory Information Management System
NACTVET	National Council for Technical and Vocational Education and Training
NOS	National Occupational Standard
OS	Occupational Standard
OSHA	Occupational Safety and Health Administration
TBS	Tanzania Bureau of Standards
TET	Technical Education and Training
TFDA	Tanzania Food and Drug Administration
TVET	Technical and Vocational Education and Training

GLOSSARY OF TERMS

Circumstantial knowledge:	Detailed knowledge, which allows the decision-making in regard to different circumstances and cross cutting issues.
Competence:	The ability to use knowledge, understanding, practical, and thinking skills to perform effectively to the workplace standards required in employment.
Competency:	A description of the ability one possesses when able to perform a given occupational task effectively and efficiently.
Competency-based Education:	An instructional programme that derives its content from validated tasks and bases assessment on the learner's performance.
Curriculum:	A description or composite of statements about "what is to be learned" by the trainee/student in a particular instructional programme; a product that states the "intended learning outcomes".
Educational/Training Programme:	The complete curriculum and instruction (what and how) that is designed to prepare a person for employment in a job or other particular performance situation.
Occupation:	A specific position requiring the performance of specific tasks – essentially the same tasks are performed by all employees having the same title.(Example: baker)
Occupational Area:	This is a broad grouping of related jobs. (Example: food service)
Occupational Competence:	The application of knowledge and skills to perform consistently to the standards required in the work context.
Occupational Standards:	Specific requirements of competences people are expected to demonstrate in a particular occupational area, including knowledge and relevant attitudes. They also act as a performance tool of assessment of the prescribed outcomes.
Performance Criteria:	Indicate the expected end results or outcomes in the form of evaluative statements.

Skills:	The ability to perform occupational tasks with a high degree of proficiency within a given occupation. Skill is conceived of as a composite of three completely interdependent components: cognitive, affective, and psychomotor.
Standards:	It is a set of statement, which if proved true under working conditions, means that an individual is meeting an expected level and type of performance.
Task Analysis:	The process of analysing each task to determine the steps, related knowledge, attitudes, performance criteria, tools and materials needed, and safety concerns required of employees performing it.
Task:	A work activity that has a definite beginning and ending, is observable or measurable, and consists of two or more definite steps, and leads to a product, service, or decision.
Underpinning Knowledge:	This is crucial knowledge that an individual must acquire in order to demonstrate competences that are associated in performing a given task.
Verification Process:	The process of having experts review and confirm the importance of the task (competency) statements identified through occupational analysis.Other questions, such as the degree of task learning difficulty are also frequently asked. This process is also sometimes referred to as validation.

1.0. INTRODUCTION

Technical Education and Training (TET) is one of the most important education sub-sectors in Tanzania, responsible for developing a skilled workforce to support the country's industrialization economic agenda. Tanzania's Development Vision 2025 intends to raise the country's economy to a middle-income status. This requires a skilled workforce that is aligned with the needs of the public and private sectors of the economy. The National Council for Technical and Vocational Education and Training has begun the job of drafting occupational standards that will eventually be adopted as National Occupational Standards for TET in order to ensure that it meets the needs of the labour market and the country's economic agenda.

National Occupational Standards (NOS) are performance criteria that are matched with labour market demands. Each National Occupational Standard describes functions, performance criteria, and knowledge/understanding for one important function or task. They combine skills, knowledge, and attitudes to describe best practice. They are useful tools for establishing job roles, personnel recruiting, supervision, and appraisal, as well as TET standards. They're also helpful for benchmarking and harmonizing qualifications on a national and international level. Standards, in general, provide a solid framework for high-quality TET that is labour market-relevant, current, and consistent in delivery across all public and private institutions.

However, it must be noted that, Occupational Standards and training standards/qualifications standards are different. Occupational standards are defined in terms of activities performed by a person in a selected occupation (e.g., an electrical engineer designs electrical wiring circuits, performs troubleshooting in electrical wiring, etc.) and they are usually defined by employers following procedures agreed upon by all stakeholders. Education and training standards are developed from the activities defined in occupational standards, and they include learning objectives to ensure that the necessary skills and knowledge are developed by a person to enable him or her to function at an agreed level in an occupation. Education and training standards are used to define curricula in training institutions. It is however critical that there must be a direct link between the occupational standards and the training standards to respond to demands of the labour market.

In TET delivery, Tanzania adopted the Competence Based Education and Training (CBET) approach. The CBET approach focuses on providing learners with the skills and knowledge required to meet the occupational standards. Occupational standards are thus the starting point for developing competency-based education and training (CBET) programmes. TET institutions will be required to benchmark their curricula with relevant occupational standards.

Occupational standards are developed based on a given occupation's current and future demands. As a result, they serve as a means of bridging the gap between the worlds of employment and technical education and training (TET). The Occupation of Food Inspection and Testing Engineer has its own set of occupational standards. The document explains how the occupational standards were developed, as well as the scope, the occupational profile in the form of DACUM charts, and the occupational standards.

2.0. OCCUPATIONAL STANDARD DEVELOPMENT PROCESS

The occupational standards development process began with an examination of major documents that guide Tanzanian skill development. The 10-year National Skills Development Strategy (2016-2026) was one of the documents reviewed, and it outlined six (6) economic sectors that should be prioritized when developing skills development programmes.

These sectors include: Transport and Logistics, Tourism and Hospitality, Agribusiness, Construction, Energy, and ICT. NACTVET labour market reports were also used in the literature review to determine the skills demand in the Tanzanian labour market as a whole.

After the literature review, a workshop comprised of expert workers and educators with substantial knowledge and experience in the occupation conducted an occupational analysis utilizing the DACUM approach to produce the occupational profile. The analysis resulted in DACUM charts, which are attached as **Appendix 1** to this document.

The occupational standards were then developed. Experts in Occupational Analysis and the Development of Occupational Standards facilitated the workshop. Interviews, online surveys, and a stakeholder forum were used to validate the occupational standards. Engineers, supervisory technicians on the job, and experienced food inspection and testing engineer were key informants in the survey to discover occupational trends. This information was used to gain insight from the workplaces regarding trends and changes in the occupation, including how well graduates are prepared for working in the occupation. A total of … online surveys were completed by experts from the labour market across the country. Apart from the survey aiding in defining the scope for the occupational analysis, they also served to engage a wide cross-section of experts in the occupation. The stakeholders' forum was attended by … participants from different parts of the country representing various companies.

3.0. THE SCOPE AND OVERVIEW OF THE OCCUPATIONAL STANDARDS FOR FOOD INSPECTION AND TESTING ENGINEERS

These standards cover a broad range of duties and tasks that can be performed by a Food Inspection and Testing Engineer. However, the occupational standards are not meant to replace individual job

descriptions, they are to be used for guidance in defining skill levels and knowledge for the technician in specific settings or positions. The Food Inspection and Testing Engineer may perform tasks in a number of key areas of the occupational standards, but not necessarily in all areas. For example, in large operations, other individuals may be employed or designated to perform specific tasks.

Food Inspection and Testing Engineer is responsible for laboratory safety management, sampling management, sample management, and large-scale instrument and equipment management. It is also responsible for confirming testing methods and participating in external quality control to ensure the effectiveness of results. The Food Inspection and Testing Engineer performs mass spectrometry testing, pathogenic bacteria testing, generate reports, and review original records and testing reports. Usually, the Food Inspection and Testing Engineer performs the following responsibilities:

a) Sampling management

b) Sample management

c) Large instrument and equipment management

d) Mass spectrometry detection

e) Pathogenic bacteria detection

f) Record and report review

g) External inspection quality control

h) Confirmation of testing method

i) Laboratory safety management

The Occupational Standards have been clustered into NTA qualification levels i.e. NTA levels 7 and 8.

4.0. VALIDITY PERIOD

Due to the rapid development of technology, the validity period of occupational standards is 3-5 years. The review will proceed in the same manner as the one before it, with new occupational standards being developed based on current trends of the labour market.

5.0. OCCUPATIONAL STANDARDS

5.1 OCCUPATIONAL STANDARDS FOR FOOD INSPECTION AND TESTING ENGINEER- NTA 4

OCCUPATION	FOOD INSPECTION AND TESTING ENGINEER	**OCCUPATION CODE**	
DUTY TITLE	SAMPLING MANAGEMENT	**DUTY NO.**	**701**
TASK TITLE	PREPARING SAMPLING OPERATION INSTRUCTIONS	**TASK NO.**	**7011**
PERFORMANCE CRITERIA	The person performing this task must be able to prepare sampling operation instructions based on the sampling plan and plan to ensure that the sampled samples have sufficient representativeness and effectiveness		
RANGE STATEMENT	This task may be carried out in a food testing laboratory under the supervision of a senior food inspection and testing engineer. The following equipment and tools will be required in performing the task: 1. Sampling plan; 2. Sampling scheme; 3. General rules for food sampling inspection; 4. Measures for food safety sampling management; 5. Computer.		

EVIDENCE REQUIREMENTS	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Confirm sampling plan and sampling plan requirements; 2. Confirm the sampling nature; 3. Prepare operation instruction objectives; 4. Establish scope of application for operation instructions; 5. Establish responsibilities for sampling process; 6. Develop sampling procedures; 7. Prepare sampling-related records.	**Detailed Knowledge About:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Control sampling plan; 1.2 Implement sampling plan; 1.3 Prepare sampling operation instructions; 1.4 Implement sampling. **2.0 Principles** The person performing this task must be able to explain the following principles: 2.1 Random sampling; 2.2 Sampling representativeness; 2.3 Sampling typicality; 2.4 Accreditation Criteria for the Competence of Testing and Calibration Laboratories (ISO/IEC 17025). **3.0 Theories** The person performing this task must be able to explain the following: 3.1 Sampling workflow and specific operations; 3.2 Sampling methods for products in different fields;

	3.3 Sampling methods for different categories of product s; 3.4 Use of sampling tools; 3.5 Transportation management methods for sampled pro ducts. **4.0 Essential Skills** 4.1 Communication skills; 4.2 Customer Service skills; 4.3 Management skills; 4.4 Summarizing ability; 4.5 Computer application skills.
DESCRIPTION ON THE END PRO DUCT / SERVICE	Prepare sampling operation instructions based on the samp ling plan and scheme.
CIRCUMSTANTIAL KNOWLEDG E:	**Detailed Knowledge About:** 1. Occupational health and safety; 2. Sampling techniques in food analysis; 3. Food safety standards.

OCCUPATION	FOOD INSPECTION AND TESTING EN GINEER	**OCCUPATION CODE**	
DUTY TITLE	SAMPLING MANAGEMENT	**DUTY NO.**	**701**
TASK TITLE	DEVELOPING SAMPLING PLAN AND SCHEME	**TASK NO.**	**7012**
PERFORMANCE C RITERIA	The person performing this task must be able to develop a food safety sampl ing plan and scheme based on the needs of food safety supervision work, so that the sampling can be operated and reflect the overall quality of the produ ct		
RANGE STATEME NT	This task may be carried out in a food testing laboratory under the supervisi on of a senior food inspection and testing engineer. The following equipment and tools will be required in performing the task: 1. Annual plan for superior food safety sampling inspection; 2. Results of preliminary food safety testing; 3. Quality control plan for products requiring special attention; 4. Computer.		

EVIDENCE REQUIREMENTS

PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must b e able to do the following: 1. Develop the purpose and indicator s of sampling; 2. Select high-risk samples as the key objects of the sampling plan; 3. Determine the food varieties for sa mpling inspection; 4. Develop sampling procedures, met hods, quantity, and other requirem ents; 5. Develop inspection items, inspecti on methods, and judgment criteria and other inspection requirements; 6. Determine the submission method and time limit for sampling results and summary analysis.	**Detailed Knowledge About:** **1.0 Methods** The person performing this task must be able to explain ho w to: 1.1 Interpret laws, regulations, and related rules; 1.2 Implement sampling requirements; 1.3 Accumulate sampling experience; 1.4 Summarize and analyze data. **2.0 Principles** The person performing this task must be able to explain th e following principles: 2.1 Sampling plan and scheme development; 2.2 Product risk assessment standards; 2.3 Food classification and product standards; 2.4 Accreditation Criteria for the Competence of Testing and Calibration Laboratories (ISO/IEC 17025); 2.5 Quality Management System (ISO 9001). **3.0 Theories** The person performing this task must be able to explain th e following: 3.1 Classification and plan for sampling inspection; 3.2 Different sampling methods: random sampling, stratif ied sampling, stratified random sampling, systematic sampling, etc; 3.3 Sampling by attributes and measurement inspection

	methods. **4.0 Essential Skills** 4.1 Objective and rigorous work attitude; 4.2 Ability to insight and control risks; 4.3 Communication and contingency ability; 4.4 Quick learning skills; 4.5 Comprehensive analysis and processing skills;
DESCRIPTION ON THE END PRODUCT / SERVICE	Develop sampling plan and scheme to accurately guide sampling.
DETAILED KNOWLEDGE:	**Detailed Knowledge About:** 1. Occupational safety and health; 2. Specifications for safe and standardized operation of equipment; 3. Analytical chemistry; 4. Testing laboratory management.

OCCUPATION	FOOD INSPECTION AND TESTING ENGINEER	**OCCUPATION CODE**	
DUTY TITLE	SAMPLING MANAGEMENT	**DUTY NO.**	**701**
TASK TITLE	ASSESSMENT OF SAMPLING RISK	**TASK NO.**	**7013**
PERFORMANCE CRITERIA	The person performing this task must be able to comprehensively evaluate the impact of the sampling process on the testing results based on quality risk management methods, determine measures to reduce corresponding risks, and ensure the rationality and standardization of the sampling process.		
RANGE STATEMENT	This task may be carried out in a food testing laboratory under the supervision of a senior food inspection and testing engineer. The following equipment and tools will be required in performing the task: 1. Food safety risk monitoring plans at all levels; 2. Sampling results of food safety testing; 3. Sampling instruments and equipment; 4. Computer.		

EVIDENCE REQUIREMENTS	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Clarify the purpose of sampling risk assessment; 2. Confirm the scope of sampling risk assessment; 3. Clarify the key links of sampling risk assessment; 4. Develop an implementation plan for sampling risk assessment; 5. Implement the implementation plan for sampling risk assessment; 6. Write a risk assessment report; 7. Develop response measures for sampling risk assessment results.	**Detailed Knowledge About:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Access to official data; 1.2 Summarize and sort out data; 1.3 Assess food safety risk points and degree of risk; 1.4 Develop food safety risk prevention and control measures. **2.0 Principles** The person performing this task must be able to explain the following principles: 2.1 Problem-oriented; 2.2 Risk assessment; 2.3 Science, openness, and impartiality; 2.4 Integrity; 2.5 Objectivity and rigor; 2.6 Accreditation Criteria for the Competence of Testing and Calibration Laboratories (ISO/IEC 17025); 3.2 Quality Management System (ISO 9001). **3.0 Theories** The person performing this task must be able to explain the following: 3.1 Risk assessment procedure; 3.2 Sampling risk rating method.

	4.0 Essential Skills 4.1 Data processing and analysis skills; 4.2 Communication and contingency skill; 4.3 Management skills; 4.4 Ability to insight and control risks.
DESCRIPTION ON THE END PRODUCT / SERVICE	Develop a sampling risk assessment report and propose solutions to minimize sampling risks.
DETAILED KNOWLEDGE:	**Detailed Knowledge About:** 1. Food safety laws and regulations; 2. Food safety standards; 3. Occupational health and safety; 4. Food safety; 5. Food safety and quality management; 6. Mathematical statistics.

OCCUPATION	FOOD INSPECTION AND TESTING ENGINEER	**OCCUPATION CODE**	
DUTY TITLE	SAMPLE MANAGEMENT	**DUTY NO.**	**702**
TASK TITLE	DEVELOP SAMPLE MANAGEMENT PROCEDURES	**TASK NO.**	**7021**
PERFORMANCE CRITERIA	The person performing this task must be able to develop sample management program documents to standardize the activities of sample reception, preparation, transmission, preservation, and processing, in order to ensure effective control of the entire process from sample reception to sample processing.		
RANGE STATEMENT	This task may be carried out in a food testing laboratory under the supervision of a senior food inspection and testing engineer. The following equipment and tools will be required in performing the task: 1. Standard for laboratory sample management; 2. Laboratory quality manual; 3. Computer.		

EVIDENCE REQUIREMENTS

PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Develop the purpose, scope of application and responsibilities of developing procedures; 2. Develop procedures for receiving and registering samples; 3. Develop sample identification and circulation procedures; 4. Develop procedures for sample preparation; 5. Develop procedures for sample preservation and processing; 6. Develop management process for keeping and preparation of samples.	**Detailed Knowledge About:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Accumulate knowledge of sample management; 1.2 Possess sample management capabilities; 1.3 Interpret sample management standards; 1.4 Develop sample management documents. **2.0 Principles** The person performing this task must be able to explain the following principles: 2.1 Sample management; 2.2 Integrity; 2.3 Objectivity and rigor; 2.4 Science, openness, and impartiality; 2.5 Specification for compilation of sample management procedures. **3.0 Theories** The person performing this task must be able to explain the following: 3.1 Good Laboratory Practice (GLP); 3.2 Accreditation Criteria for the Competence of Testing and Calibration Laboratories (ISO/IEC 17025); 3.3 Laboratory sample management methods. **4.0 Essential Skills**

	4.1 Document writing skills; 4.2 Management skills; 4.3 Ability to analyze and summarize data; 4.4 Good speaking skills; 4.5 Computer application skills.
DESCRIPTION ON THE END PRODUCT / SERVICE	Develop sample management procedures to guide sample management activities.
DETAILED KNOWLEDGE:	**Detailed Knowledge About:** 1. Occupational health and safety; 2. Testing laboratory management.

OCCUPATION	FOOD INSPECTION AND TESTING ENGINEER	**OCCUPATION CODE**	
DUTY TITLE	SAMPLE MANAGEMENT	**DUTY NO.**	**702**
TASK TITLE	PREPARING SAMPLE PREPARATION OPERATION INSTRUCTIONS	**TASK NO.**	**7022**
PERFORMANCE CRITERIA	The person performing this task must be able to develop sample preparation operation instructions in accordance with the sample management procedures, standardize sample preparation activities, and ensure the uniformity and representativeness of the samples		
RANGE STATEMENT	This task may be carried out in a food testing laboratory under the supervision of a senior food inspection and testing engineer. The following equipment and tools will be required in performing the task: 1. Assignment for testing tasks 4. Sample management procedures 5. Computer		

EVIDENCE REQUIREMENTS

PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Develop specific requirements for sample preparation in terms of testing task assignment, product standards, and method standards; 2. List the purpose of developing the operation instructions; 4. Specify the scope of application for operation instructions; 4. Develop overall requirements and reference basis for sample; 5. Standardize the preparation methods for different types of samples and different testing items; 6. Develop response plans for special situations; 7. List normative references; 8. Confirm relevant record formats; 9. Confirm relevant appendixes.	**Detailed Knowledge About:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Prepare different food samples; 1.2 Prepare items in the sample preparation operation instructions and form a guidance document. **2.0 Principles** The person performing this task must be able to explain the following principles: 2.1 Specifications for developing sample preparation operation instructions; 2.2 Product execution standards; 2.3 Testing method standards. **3.0 Theories** The person performing this task must be able to explain the following: 3.1 Good Hygiene Practices (GHP); 3.2 Good Manufacturing Practice (GMP); 3.3 Accreditation Criteria for the Competence of Testing and Calibration Laboratories (ISO/IEC 17025); 3.4 Sample pretreatment technology; 3.5 Laboratory and test samples; 3.5 Food sample preparation method; 3.6 Reasons and solutions for sample contamination; 3.7 Reasons and solutions for the loss of sample compone

	nts. **4.0 Essential Skills** 4.1 Ability to insight and control risks; 4.2 Communication and contingency ability.
DESCRIPTION ON THE END PRODUCT / SERVICE	Develop sample preparation operation instructions based on task assignments, product, and method standards to guide sample preparation.
DETAILED KNOWLEDGE:	**Detailed Knowledge About:** 1. Laboratory safety operation methods; 2. Instrument and equipment safety operating procedures; 3. Occupational health and safety; 4. Testing laboratory management.

OCCUPATION	FOOD INSPECTION AND TESTING ENGINEER	**OCCUPATION CODE**	
DUTY TITLE	SAMPLE MANAGEMENT	**DUTY NO.**	**702**
TASK TITLE	PREPARING SAMPLING MANAGEMENT OPERATION INSTRUCTIONS	**TASK NO.**	**7023**
PERFORMANCE CRITERIA	The person performing this task must be able to develop sample management operation instructions in accordance with the requirements of the sample management procedure, implement effective control over sample management, and ensure the effectiveness of testing results.		
RANGE STATEMENT	This task may be carried out in a food testing laboratory under the supervision of a senior food inspection and testing engineer. The following equipment and tools will be required in performing the task: 1. Sample management procedures; 2. Computer.		

EVIDENCE REQUIREMENTS

PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Develop the purpose of sampling management operation instructions; 2. Develop the scope of application of sample management operation instructions; 3. Develop the responsibilities of the sample management functional department; 4. Develop on-site numbering, sample reception, and sample identification processes for sample management procedures; 5. Develop sample storage and preparation processes in the sample management process; 6. Develop the sample receiving and return process in the sample management process; 7. Develop sample keeping and disposal processes in the sample management process; 8. Develop a sample data storage process.	**Detailed Knowledge About:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Manage general samples properly; 1.2 Manage kept samples properly; 1.3 Manage retest samples properly. **2.0 Principles** The person performing this task must be able to explain the following principles: 2.1 Preparation of sample management operation instructions; 2.2 Good Laboratory Practice (GLP); 2.3 Accreditation Criteria for the Competence of Testing and Calibration Laboratories (ISO/IEC 17025). **3.0 Theories** The person performing this task must be able to explain the following: 3.1 Purpose of sample management; 3.2 Job requirements for sample manager; 3.3 Requirements for sample reception, identification, warehousing, and circulation; 3.4 Sample preparation requirements; 3.5 Sample storage requirements; 3.6 Sample data storage requirements; 3.7 Management procedure for inspection items and articles;

	3.8 Control procedure for facility and environmental cond ition. **4.0 Essential Skills** 4.1 Management skills; 4.2 Communication and contingency ability; 4.3 Ability to summarize.
DESCRIPTION ON THE END PRO DUCT / SERVICE	Develop sample management operation instructions accord ing to sample management procedures.
DETAILED KNOWLEDGE:	**Detailed Knowledge About:** 1. Basic operating regulations for laboratory safety; 2. Occupational health and safety; 3. Testing laboratory management; 4. Disposal of laboratory waste; 5. Testing laboratory management.

OCCUPATION	FOOD INSPECTION AND TESTING ENGINEER	**OCCUPATION CODE**	
DUTY TITLE	LARGE INSTRUMENT AND EQUIPMENT MANAGEMENT	**DUTY NO.**	**703**
TASK TITLE	PROCUREMENT AND ACCEPTANCE OF LARGE INSTRUMENTS AND EQUIPMENT	**TASK NO.**	**7031**
PERFORMANCE CRITERIA	The person performing this task must be able to purchase and accept large instruments and equipment in accordance with the requirements of the management standards for large instruments and equipment and the requirements of testing items.		
RANGE STATEMENT	This task may be carried out in the laboratory and testing workshop under the supervision of a senior food inspection and testing engineer. The following equipment and tools will be required in performing the task: 1. Equipment procurement and acceptance procedure report; 2. Related large instruments and accessories: chromatography; spectroscopy, and mass spectrometers, fully automated microbial identification instruments, etc; 3. Materials required for the experiment: reagents, volumetric flask, pipettes, volumetric flask, filter paper, etc; 4. Laboratory safety protection equipment: fume hood, secondary biological laboratory, Class 100 clean laboratory, etc; 5. Personal Protective Equipment (PPE) : goggles, gloves, work clothes, etc; 6. Computer.		

EVIDENCE REQUIREMENTS	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Take occupational health and safety precautions when performing the task; 2. Submit the application report for the purchase of large instruments and equipment according to the requirements; 3. Carry out market research and selection of proposed equipment; 4. Participate in the expert demonstration of large precision instruments and equipment; 5. Purchase large instruments and equipment according to the plan; 6. Prepare the installation conditions for large instruments; 7. Check the appearance, model and accessory list of the incoming instr	**Detailed Knowledge About:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Make research on equipment model; 1.2 Execute procurement procedures; 1.3 Perform visual inspection of equipment; 1.4 Perform technical acceptance of equipment. **2.0 Principles** The person performing this task must be able to explain the following principles: 2.1 Equipment procurement; 2.2 Acceptance of instruments and equipment; 2.3 Operating procedures for large instruments and equipment; 2.4 Good Laboratory Practice (GLP); 2.5 Accreditation Criteria for the Competence of Testing and Calibration Laboratories (ISO/IEC 17025).

uments; 8. Organize technical acceptance of i nstruments; 9. Submit the acceptance report to the equipment supervisor; 10. Dispose of wastes; 11. Clean tools, equipment and workpl ace.	**3.0 Theories** The person performing this task must be able to explain th e following: 3.1 Principles and applications of large instrument analysi s; 3.2 Maintenance and management of instruments and equ ipment; 3.3 Technical acceptance of equipment core indicators; 3.4 Reasons and solutions for the deviation of technical in dicators of instruments and equipment. **4.0 Essential Skills** 4.1 Communication and understanding ability; 4.2 Market research skills; 4.3 Teamwork skills; 4.4 Data processing and analysis skills; 4.5 Report writing skills.
DESCRIPTION ON THE END PRO DUCT / SERVICE	Procurement and acceptance of relevant large instruments and equipment according to the procurement management method.
DETAILED KNOWLEDGE:	**Detailed Knowledge About:** 1. Occupational health and safety; 2. Basic operating regulations for laboratory safety; 3. Instrument and equipment safety operating procedure s; 4. Testing laboratory management; 5. Disposal of laboratory wastes.

OCCUPATION	FOOD INSPECTION AND TESTING ENGINEER	**OCCUPATION CODE**	
DUTY TITLE	LARGE INSTRUMENT AND EQUIPMENT MANAGEMENT	**DUTY NO.**	**703**
TASK TITLE	METROLOGICAL TRACEABILITY AND INTERMEDIATE CHECK OF LARGE INSTRUMENTS AND EQUIPMENT	**TASK NO.**	**7032**
PERFORMANCE CRITERIA	The person performing this task must be able to perform quantity traceability and intermediate check on large instruments and equipment in accordance with the standard requirements of the measurement traceability control procedures and intermediate check procedures.		
RANGE STATEMENT	This task may be carried out in the laboratory under the supervision of a senior food inspection and testing engineer. The following equipment and tools will be required in performing the task: 1. Instrument and equipment operating manual; 2. Operation instructions for intermediate check of instruments and equipment; 3. Related large instruments and accessories: chromatography, spectroscopy, and mass spectrometers, fully automated microbial identification instruments, etc; 4. Materials required for the experiment: reagents, volumetric flask, pipettes, volumetric flask, filter paper, etc; 5. Laboratory safety protective equipment: fume hood, secondary biological laboratory, Class 100 clean laboratory, etc; 6. Personal Protective Equipment (PPE): goggles, gloves, work clothes, etc; 7. Computer.		

EVIDENCE REQUIREMENTS	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Take occupational health and safety precautions when performing the task; 2. List the large equipment used for testing/calibration, and prepare the metrological traceability plan of the equipment; 3. Determine equipment calibration parameters; 4. Confirm the results of the metrological traceability on the verification/calibration certificate; 5. Provide metrological confirmation labels in prominent locations; 6. Evaluate the status of large instruments and equipment, and prepare a	**Detailed Knowledge About:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Develop a metrological traceability plan for equipment; 1.2 Prepare the intermediate check plan of equipment; 1.3 Confirm verification/calibration results; 1.4 Conduct intermediate check; 1.5 Assess the results of intermediate check. **2.0 Principles** The person performing this task must be able to explain the following principles: 2.1 Check of large instruments and equipment; 2.2 Metrological traceability; 2.3 Good Laboratory Practice (GLP);

plan for equipment intermediate check; 7. Check during implementation and make records; 8. Evaluate and process the results of intermediate check; 9. Dispose of wastes; 10. Clean tools, equipment and workplace.	2.4 Accreditation Criteria for the Competence of Testing and Calibration Laboratories (ISO/IEC 17025); 2.5 Quality Management System (ISO 9001). **3.0 Theories** The person performing this task must be able to explain the following: 3.1 Metrological traceability procedure and intermediate check procedure; 3.2 International Vocabulary of Metrology (ISO/IEC Guide 99); 3.3 Basic knowledge of measurement; 3.4 Theory of intermediate check of instruments; 3.5 Measurement error theory; 3.6 Knowledge of metrological traceability. **4.0 Essential Skills** 4.1 Ability to identify and solve problems; 4.2 Communication skills; 4.3 Data processing and analysis skills; 4.4 Quick learning skills; 4.5 Writing skills; 4.6 Computer application skills.
DESCRIPTION ON THE END PRODUCT / SERVICE	Conduct metrological traceability and intermediate check based on the performance requirements of instruments.
DETAILED KNOWLEDGE:	Detailed Knowledge About: 1. Occupational health and safety; 2. Basic operating regulations for laboratory safety; 3. Instrument analysis; 4. Testing laboratory management; 5. Disposal of laboratory wastes.

OCCUPATION	FOOD INSPECTION AND TESTING ENGINEER	**OCCUPATION CODE**	
DUTY TITLE	LARGE INSTRUMENT AND EQUIPMENT MANAGEMENT	**DUTY NO.**	**703**
TASK TITLE	MANAGEMENT AND MAINTENANCE OF LARGE INSTRUMENTS AND EQUIPMENT	**TASK NO.**	**7033**
PERFORMANCE CRITERIA	The person performing this task must be able to manage and maintain large instruments and equipment in accordance with the requirements of the management procedures for large instruments and equipment.		
RANGE STATEMENT	This task may be carried out in the laboratory under the supervision of a senior food inspection and testing engineer. The following equipment and tools will be required in performing the task: 1. Instrument and equipment usage management procedures; 2. Instrument operating manual; 3. Related large instruments and equipment: chromatography spectroscopy, and mass spectrometers, fully automated microbial identification instruments, etc; 4. Materials required for the experiment: reagents, volumetric flask, pipettes, volumetric flask, filter paper, etc; 5. Laboratory safety protective equipment: fume hood, secondary biological laboratory, Class 100 clean laboratory, etc; 6. Personal Protective Equipment (PPE): goggles, gloves, work clothes, etc; 7. Computer.		

EVIDENCE REQUIREMENTS

PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Take occupational health and safety precautions when performing the task; 2. Establish technical archives for large instruments and equipment; 3. Establish operating procedures for large instruments and equipment; 4. Make instrument and equipment status labels; 5. Develop a maintenance plan for instruments and equipment; 6. Maintain instruments and equipment and make records; 7. Maintain high-performance liquid chromatography solvent delivery pump; Maintain the UV visible detector, perform daily maintenance and troubleshooting on the workstat	**Detailed Knowledge About:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Manage large instruments and equipment 1.2 Maintain large instruments and equipment 1.3 Troubleshoot large instrument and equipment 1.4 Scrap instruments and equipment **2.0 Principles** The person performing this task must be able to explain the following principles: 2.1 Specification for safe operation of instruments and equipment 2.2 Equipment management 2.3 Good Laboratory Practice (GLP) 2.4 Accreditation Criteria for the Competence of Testing and Calibration Laboratories (ISO/IEC 17025)

ion; Maintain the high performanc e liquid chromatography solvent d elivery pump; Maintain the UV vi sible detector and perform daily m aintenance and troubleshooting on the workstation; 8. Repair or report according to the fa ult situation; 9. Apply for scrapping of large instru ments and equipment that cannot meet experimental requirements; 10. Implement scrapping and update ar chives of equipment in use; 11. Dispose of wastes; 12. Clean tools, equipment and workpl ace.	**3.0 Theories** The person performing this task must be able to explain th e following: 3.1 Common faults and troubleshooting methods of high-performance liquid chromatography; 3.2 Common faults and troubleshooting methods of gas c hromatography; 3.3 Operating principles and application regulations of lar ge instruments; 3.4 Knowledge of instrument and equipment management in testing laboratories; 3.5 Knowledge of using and maintaining large instrument s; 3.6 Instrument management and maintenance methods 3.7 Instrument troubleshooting methods; 3.8 Common faults and troubleshooting methods of high-performance liquid chromatography; 3.9 Common faults and troubleshooting methods of gas c hromatography; **4.0 Essential Skills** 4.1 Communication skills; 4.2 Computer skills; 4.3 Continuous learning ability; 4.4 Emergency response capability.
DESCRIPTION ON THE END PRO DUCT / SERVICE	Manage and maintain instruments and equipment accordin g to their performance requirements.
DETAILED KNOWLEDGE:	**Detailed Knowledge About:** 1. Occupational health and safety; 2. Basic operation for laboratory safety; 3. Instrument analysis; 4. Testing laboratory management; 5. Disposal of laboratory waste.

OCCUPATION	FOOD INSPECTION AND TESTING ENGINEER	**OCCUPATION CODE**	
DUTY TITLE	LARGE INSTRUMENT AND EQUIPMENT MANAGEMENT	**DUTY NO.**	**703**
TASK TITLE	TRAINING ON THE USE OF LARGE INSTRUMENTS AND EQUIPMENT	**TASK NO.**	**7034**
PERFORMANCE CRITERIA	The person performing this task must be able to operate large instruments and equipment and train relevant persons in accordance with the requirements of the management procedures for large instruments and equipment.		
RANGE STATEMENT	This task may be carried out in the laboratory under the supervision of a senior food inspection and testing engineer. The following equipment and tools will be required in performing the task: 1. Instrument and equipment operating procedures; 2. Instrument operating manual; 3. Relevant instruments and equipment: chromatographic, spectral and mass spectrometric instruments, filtration devices, solid phase extraction devices, rotary evaporator, termovap sample concentrator, etc; 4. Reagent consumables required for experiment: reagents, filtrating membranes, sample bottles, pipettes, volumetric flask, etc; 5. Personal Protective Equipment (PPE): goggles, gloves, work clothes, etc; 6. Computer.		

EVIDENCE REQUIREMENTS

PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Take occupational health and safety precautions when performing the task; 2. Accept strict training on instrument and equipment operation and pass the assessment; 3. Accept authorization to use large instruments and equipment; 4. Use instruments and equipment according to operating procedures; 5. Make records for use of large instruments and equipment; 6. Conduct safety checks on instruments and equipment before and after use; 7. Participate in continuing education training on instruments and equipment; 8. Provide equipment operation training for other employees;	**Detailed Knowledge About:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Operate large instruments and equipment; 1.2 Train on the use of instruments and equipment. **2.0 Principles** The person performing this task must be able to explain the following principles: 2.1 Good Laboratory Practice (GLP); 2.2 Accreditation Criteria for the Competence of Testing and Calibration Laboratories (ISO/IEC 17025); 2.3 Similarity and compatibility; 2.4 Selection of mobile and stationary phases in liquid chromatography; 2.5 Selection of stationary liquids for gas chromatography. **3.0 Theories** The person performing this task must be able to explain the following: 3.1 Working principles and applications of large instrume

9. Dispose of wastes; 10. Clean tools, equipment and workplace.	nt; 3.5 Knowledge of using and maintaining large instruments; 3.3 Knowledge of food inspection and testing; 3.4 Error analysis theory; 3.5 Knowledge of instrument and equipment management in testing laboratories; 3.6 Basic theory of chromatography; 3.7 Plate theory; 3.8 Rate theory; 3.9 Principles of chromatographic determination and quantification. **4.0 Essential Skills** 4.1 Chart data processing ability; 4.2 Ability to analyze data results; 4.3 Ability to solve problems; 4.4 Continuous learning ability; 4.5 Speaking skills. **5.0 Math skills** 5.1 Mathematical statistics skills;
DESCRIPTION ON THE END PRODUCT / SERVICE	Carry out the use and training of instruments and equipment according to the operating procedures of each instrument.
DETAILED KNOWLEDGE:	**Detailed Knowledge About:** 1. Occupational health and safety; 2. Basic operating regulations for laboratory safety; 3. Instrument and equipment safety operating procedures 4. Instrument analysis; 5. Testing laboratory management; 6. Disposal of laboratory wastes.

OCCUPATION	FOOD INSPECTION AND TESTING ENGINEER	**OCCUPATION CODE**	
DUTY TITLE	MASS SPECTROMETRY DETECTION	**DUTY NO.**	**704**
TASK TITLE	MASS SPECTROMETRY ANALYSIS	**TASK NO.**	**7041**
PERFORMANCE CRITERIA	The person performing this task must be able to use mass spectrometers for food testing and analysis in accordance with inspection and testing specifications		
RANGE STATEMENT	This task may be carried out in the laboratory under the supervision of a senior food inspection and testing engineer. The following equipment and tools will be required in performing the task: 1. Testing standard; 2. Operating manual for mass spectrometer; 3. Relevant instruments and equipment: LC-MS instrument, GC-MS instrument, inductively coupled plasma mass spectrometer, analytical balance, filtrating device, solid phase extraction device, rotary evaporator, termovap sample concentrator, microwave digestion instrument, water purifier, etc; 4. Consumables required for experiment: reagents, filtrating membranes, sample bottles, pipettes, volumetric flask, etc; 5. Personal Protective Equipment (PPE): goggles, gloves, work clothes, etc; 6. Computer.		

EVIDENCE REQUIREMENTS

PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Take occupational health and safety precautions when performing the task; 2. Receive training on mass spectrometer operation and obtain authorization; 3. Preparation of reagents and sample pre-treatment; 4. Use mass spectrometer according to operating procedures; 5. Optimize the parameters setting of mass spectrometer; 6. Design and process standard samples, blank samples, and quality control samples, and establish relevant injection sequences; 7. Determination by mass spectrometer; 8. Qualitative and quantitative analysis of mass spectrum;	**Detailed Knowledge About:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Handle complex samples; 1.2 Design quality control experiments; 1.3 Operate mass spectrometer; 1.4 Analyze mass spectrum and process data; 1.5 Report mass spectrometry results. **2.0 Principles** The person performing this task must be able to explain the following principles: 2.1 Scientific and rigorous; 2.2 Qualitative and quantitative of mass spectrometry; 2.3 Good Laboratory Practice (GLP); 2.4 Accreditation Criteria for the Competence of Testing and Calibration Laboratories (ISO/IEC 17025). **3.0 Theories** The person performing this task must be able to explain th

9. Make experimental records; 10. Submit the test result report to the supervisor; 11. Dispose of wastes; 12. Clean tools, equipment and workpl ace.	e following: 3.1 Principles and applications of mass spectrometer; 3.2 Knowledge of mass spectrometry structure, operation, and spectral analysis; 3.3 Qualitative and quantitative of mass spectrometry; 3.4 Relevant knowledge of analytical chemistry; 3.5 Knowledge of data analysis and processing. **4.0 Essential Skills** 4.1 Instrument maintenance and troubleshooting capabiliti es; 4.2 Ability to analyze data results; 4.3 Ability to find and solve problems; 4.4 Continuous learning ability. **5.0 Math skills** 5.1 Significant figures and operation rules.
DESCRIPTION ON THE END PRO DUCT / SERVICE	Conduct the use and training of mass spectrometer accordi ng to the performance of mass spectrometer.
DETAILED KNOWLEDGE:	**Detailed Knowledge About:** 1. Occupational health and safety; 2. Basic operating regulations for laboratory safety; 3. Instrument and equipment safety operating procedure s; 4. Instrument analysis; 5. Testing laboratory management; 6. Disposal of laboratory waste.

OCCUPATION	FOOD INSPECTION AND TESTING ENGINEER	**OCCUPATION CODE**	
DUTY TITLE	MASS SPECTROMETRY DETECTION	**DUTY NO.**	**704**
TASK TITLE	IMPROVEMENT AND OPTIMIZATION OF MASS SPECTROMETRY MONITORING METHODS	**TASK NO.**	**7042**
PERFORMANCE CRITERIA	The person performing this task must be able to improve and optimize the testing methods of the project according to the requirements of the testing method specifications, ensuring the effectiveness of the testing results		
RANGE STATEMENT	This task may be carried out in the laboratory under the supervision of a senior food inspection and testing engineer. The following equipment and tools will be required in performing the task: 1. Testing method validation procedures; 2. Instrument operating manual; 3. Relevant instruments and equipment: chromatographic spectrometer, mass spectrometer, analytical balance, filtrating device, solid phase extraction device, rotary evaporator, termovap sample concentrator, microwave digestion instrument, water purifier, etc; 4. Consumables required for experiment: reagents, filtrating membranes, sample bottles, pipettes, volumetric flask, etc; 5. Personal Protective Equipment (PPE): goggles, gloves, work clothes, etc; 6. Computer.		

EVIDENCE REQUIREMENTS	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Take occupational health and safety precautions when performing the task; 2. Consult the existing detection methods and references; 3. Compare and screen the development of method optimization plans; 4. Conduct experiments on optimized detection methods; 5. Conduct methodological validation; 6. Evaluate the uncertainty of the new method; 7. Write an experimental report on method optimization; 8. Dispose of wastes; 9. Clean tools, equipment and workplace.	**Detailed Knowledge About:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Develop an optimized testing plan; 1.2 Verify the feasibility and effectiveness of detection methods; 1.3 Evaluate method uncertainty. **2.0 Principles** The person performing this task must be able to explain the following principles: 2.1 Mass spectrometry detection specifications; 2.2 Qualitative of mass spectrometry. **3.0 Theories** The person performing this task must be able to explain the following: 3.1 Good Laboratory Practice (GLP);

	3.2 Accreditation Criteria for the Competence of Testing and Calibration Laboratories (ISO/IEC 17025); 3.3 Knowledge of food chemistry; 3.4 Knowledge of analytical chemistry; 3.5 Sample pretreatment knowledge; 3.6 Knowledge of large instrument analysis; 3.7 Methodology validation knowledge; 3.8 Knowledge of error theory; 3.9 Data analysis and processing methods. **4.0 Essential Skills** 4.1 Literature search capability; 4.2 Ability to analyze data results; 4.3 Ability to find and solve problems; 4.4 Continuous learning ability; 4.5 Report writing skills. **5.0 Essential Skills** 5.1 Significant figures and operation rules.
DESCRIPTION ON THE END PRODUCT / SERVICE	Optimize and improve the testing items according to the requirements of the testing method specifications;
DETAILED KNOWLEDGE:	**Detailed Knowledge About:** 1. Occupational health and safety; 2. Basic operating regulations for laboratory safety; 3. Instrument and equipment safety operating procedures; 4. Testing laboratory management; 5. Disposal of laboratory wastes.

OCCUPATION	FOOD INSPECTION AND TESTING ENGINEER	**OCCUPATION CODE**	
DUTY TITLE	MASS SPECTROMETRY DETECTION	**DUTY NO.**	**704**
TASK TITLE	IMPLEMENTING RE-TESTING	**TASK NO.**	**7043**
PERFORMANCE CRITERIA	The person performing this task must be able to conduct retesting in accordance with the regulatory requirements of the testing result management procedures		
RANGE STATEMENT	This task may be carried out in the laboratory under the supervision of a senior food inspection and testing engineer. The following equipment and tools will be required in performing the task: 1. Test result management procedures; 2. Instrument operating manual; 3. Relevant instruments and equipment: chromatographic spectrometer, mass spectrometer, analytical balance, filtrating device, solid phase extraction device, rotary evaporator, termovap sample concentrator, microwave digestion instrument, water purifier, etc; 4. Consumables required for experiment: reagents, filtrating membranes, sample bottles, pipettes, volumetric flask, etc; 5. Personal Protective Equipment (PPE): goggles, gloves, work clothes, etc; 6. Computer.		

EVIDENCE REQUIREMENTS

PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Take occupational health and safety precautions when performing the task; 2. Identify abnormal data; 3. Analyze the causes of anomalies; 4. Exclude whether it is caused by laboratory deviation; 5. Exclude sampling anomalies; 6. Resample and retest nonconformities; 7. If there is inconsistency in the retest results, retesting shall be conducted by another person; 8. Determine the results according to the judgment rules; 9. Dispose of wastes; 10. Clean tools, equipment and workplace.	**Detailed Knowledge About:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Analyze abnormal values of test results; 1.2 Retest the non-conforming items of samples; 1.3 Determine the results. **2.0 Principles** The person performing this task must be able to explain the following principles: 2.1 Testing specifications; 2.2 Validity of results; 2.3 Good Laboratory Practice (GLP); 3.2 Accreditation Criteria for the Competence of Testing and Calibration Laboratories (ISO/IEC 17025). **3.0 Theories** The person performing this task must be able to explain the following: 3.1 Food analysis theory; 3.2 Principles of instrument analysis;

	3.3 Error analysis; 3.4 Data analysis and processing. **4.0 Essential Skills** 4.1 Ability to analyze data results; 4.2 Ability to find and solve problems; 4.3 Continuous learning ability; 4.4 Critical thinking; 4.5 Communication skills.
DESCRIPTION ON THE END PRODUCT / SERVICE	Conduct retesting in accordance with the requirements of the testing result management procedures.
DETAILED KNOWLEDGE:	**Detailed Knowledge About:** 1. Occupational health and safety; 2. Basic operation for laboratory safety; 3. Instrument and equipment safety operation; 4. Knowledge of instrument analysis; 5. Basic knowledge of analytical chemistry; 6. Knowledge of testing laboratory management; 7. Disposal of laboratory wastes.

OCCUPATION	FOOD INSPECTION AND TESTING ENG INEER	**OCCUPATION CODE**	
DUTY TITLE	PATHOGENIC BACTERIA DETECTION	**DUTY NO.**	**705**
TASK TITLE	DETECTION OF COMMON PATHOGENI C BACTERIA (STAPHYLOCOCCUS AU REUS, SALMONELLA, LISTERIA MON OCYTOGENES, ETC.)	**TASK NO.**	**7051**
PERFORMANCE CR ITERIA:	The person performing this task must be able to conduct pathogen testing and judgment in accordance with inspection and testing regulations, stand ards, and biosafety requirements.		
RANGE STATEMEN T	This task may be carried out in the laboratory under the supervision of a s enior food inspection and testing engineer. The following equipment and tools will be required in performing the tas k: 1. Testing method operation instructions; 2. Laboratory safety protective equipment: biosafety laboratory, etc; 3. Relevant instruments and equipment: refrigerator, ultra clean workbe nch, biosafety cabinet, incubator, autoclave, thermostatic incubator, microscope, homogenizer, oscillator, etc; 4. Materials required for the experiment: alcohol burner, scissors, tweez ers, sterilized alcohol, petri dish, straw, pipette, inoculating loop, con ical flask, etc; 5. Personal Protective Equipment (PPE): goggles, sterile laboratory coa t, hats, gloves, masks, shoe covers, etc; 6. Corresponding standard strains; 7. Computer.		

EVIDENCE REQUIREMENTS

ACTUAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must b e able to do the following: 1. Take occupational health and safet y precautions when performing th e task; 2. Determine the method for pathoge nic bacteria testing; 3. Operation training and job authori zation for microbiological testing equipment; 4. Environmental monitoring and co nfirmation of microbial laborator y; 5. Prepare equipment, consumables, and utensils for pathogen testing; 6. Prepare culture media and reagent s for pathogenic bacteria testing; 7. Sterilization and inspection of steri le items;	**Detailed Knowledge About:** **1.0Methods** The person performing this task must be able to explain ho w to: 1.1 Prepare sterile materials; 1.2 Process sample, enrich, separate and identify; 1.3 Observe phenomena and analyze results; 1.4 Determine result. **2.0 Principles** The person performing this task must be able to explain the following principles: 2.1 Sterile operation; 2.2 Random sampling; 2.3 Data rounding; 2.4 Good Laboratory Practice (GLP); 2.5 Accreditation Criteria for the Competence of Testing a

8. Conduct aseptic treatment of samples according to standards and specifications; 9. Conduct pathogenic bacteria testing operations such as enrichment, isolation, and identification in accordance with standards and specifications; 10. Use large equipment to identify positive or complex samples; 11. Conduct result observation and analysis, and prepare and plan for the next experiment; 12. Conduct data processing and make records; 13. Deactivate the culture; 14. Dispose of wastes and surplus samples; 15. Instrument restoration and maintenance; 16. Clean tools, equipment and workplace.	nd Calibration Laboratories (ISO/IEC 17025); 2.6 Biosafety guidelines for microbiology and biomedical laboratories; 2.7 Laboratory biosafety guidelines; 2.8 General principles for microbiological testing of food. **3.0 Theories** The person performing this task must be able to explain the following: 3.1 Basic theory of pathogenic bacteria testing; 3.2 Fundamentals of special equipment pressure vessel operation; 3.3 Knowledge of microbial testing; 3.4 Knowledge of standard strain management. **4.0 Essential Skills** 4.1 Data processing and analysis skills; 4.2 Communication skills; 4.3 Report preparation skills; 4.4 Report writing skills; 4.5 Computer application skills.
DESCRIPTION ON THE END PRODUCT / SERVICE	Perform pathogen testing in samples according to standard specifications or operation instructions.
DETAILED KNOWLEDGE:	**Detailed Knowledge About:** 1. Occupational health and safety; 2. Basic operating regulations for bio-safety; 2. Equipment safety regulations and operating methods; 4. Disposal of wastes in microbiology laboratory.

OCCUPATION	FOOD INSPECTION AND TESTING ENG INEER	**OCCUPATION CODE**	
DUTY TITLE	PATHOGENIC BACTERIA DETECTION	**DUTY NO.**	**705**
TASK TITLE	ACCEPTANCE AND QUALITY CONTR OL OF CULTURE MEDIUM	**TASK NO.**	**7052**
PERFORMANCE C RITERIA:	The person performing this task must be able to inspect and control the cult ure medium in accordance with the medium acceptance and quality control procedures.		
RANGE STATEME NT	This task may be carried out in the laboratory under the supervision of a se nior food inspection and testing engineer. The following equipment and tools will be required in performing the task: 1. Acceptance and quality control procedures of culture medium; 2. Computer; 3. Instrument operating manual; 4. Relevant instruments and equipment: refrigerator, ultra clean workben ch, biosafety cabinet, incubator, autoclave, thermostatic incubator, mic roscope, homogenizer, oscillator, computer, etc; 5. Materials required for the experiment: alcohol burner, scissors, tweezer s, sterilized alcohol, petri dish, straw, pipette, inoculating loop, conical flask, etc; 6. Personal Protective Equipment (PPE): sterile laboratory coat, hats, glo ves, masks, shoe covers, etc; 7. Corresponding standard strains.		

EVIDENCE REQUIREMENTS

ACTUAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Take occupational health and safe ty precautions when performing t he task; 2. Determine acceptance or quality c ontrol objects and quality require ments; 3. Confirm the method for the perfor mance testing of culture medium and reagents; 4. Prepare equipment, consumables, and appliances required for accep tance or quality control; 5. Prepare culture media and reagent s for pathogenic bacteria testing a nd conduct sterility test; 6. Conduct acceptance or quality co ntrol on preservation and use of s trains; 7. Quantitative, semi quantitative, a nd qualitative determination of gr	**Detailed Knowledge About:** **1.0 Methods** The person performing this task must be able to explain ho w to: 1.1 Perform culture medium acceptance; 1.2 Control the culture medium. **2.0 Principles** The person performing this task must be able to explain the following principles: 2.1 Sterile operation; 2.2 Random sampling; 2.3 Quality requirements and standards for culture medium and reagents; 2.4 Traceability; 2.5 Good Laboratory Practice (GLP); 2.6 Accreditation Criteria for the Competence of Testing a nd Calibration Laboratories (ISO/IEC 17025); 2.7 Biosafety guidelines for microbiology and biomedical l aboratories;

owth rate, selectivity, and specifi city of the culture medium accord ing to standards and specification s; 8. Observe and analyze the results; 9. Record test results; 10. Deactivate the culture; 11. Clean tools, equipment and work place.	2.8 Laboratory biosafety manual; 2.9 General principles for microbiological testing of food. **3.0 Theories** The person performing this task must be able to explain the following: 3.1 Fundamentals of special equipment pressure vessel ope ration; 3.2 Acceptance and quality control of culture medium; 3.3 Microbiological test procedure. **4.0 Essential Skills** 4.1 Data processing and analysis skills; 4.2 Communication skills; 4.3 Customer service skills; 4.4 Report preparation skills; 4.5 Computer application skills.
DESCRIPTION ON THE END PR ODUCT / SERVICE	Perform the acceptance and quality control of the culture m edium according to standards and specifications.
DETAILED KNOWLEDGE:	**Detailed Knowledge About:** 1. Occupational health and safety; 2. Basic operation for bio-safety; 2. Standardized operation of equipment safety; 4. Microbiological testing; 5. Training and acceptance standards; 6. Disposal of wastes in microbiology laboratory.

OCCUPATION	FOOD INSPECTION AND TESTING ENGINEER	**OCCUPATION CODE**	
DUTY TITLE	RECORD AND REPORT REVIEW	**DUTY NO.**	**706**
TASK TITLE	REVIEW OF ORIGINAL RECORDS AND TESTING REPORTS	**TASK NO.**	**7061**
PERFORMANCE CRITERIA	The person performing this task must be able to review the original testing records and testing reports in accordance with standard specifications, and make sure they are objective, fair, and traceable		
RANGE STATEMENT	This task may be carried out in the laboratory under the supervision of a senior food inspection and testing engineer. The following equipment and tools will be required in performing the task: 1. Original testing record; 2. Testing report; 3. Product execution standard; 4. Standard for testing methods; 5. Sampling form/commission form; 6. Standard for report/certificate preparation; 7. Computer.		

EVIDENCE REQUIREMENTS

PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Verify the correctness of the testing report template selected; 2. Check the consistency and traceability of information; 3. Verify the applicability and effectiveness of standards; 4. Verify the standardization of records; 5. Confirm the accuracy of data calculation and rounding; 6. Discover abnormal data; 7. Confirm the completeness of necessary information in original records and reports.	**Detailed Knowledge About:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Prepare original records and testing reports; 1.2 Analyze food related standards; 1.3 Test food related items; 1.4 Check testing items; 1.5 Record necessary information for original records and testing reports. **2.0 Principles** The person performing this task must be able to explain the following principles: 2.1 Principles and requirements for making original records; 2.2 Principles and requirements for writing food inspection and testing reports, Accreditation Criteria for the Competence of Testing and Calibration Laboratories (ISO/IEC 17025); 2.3 Quality Management System (ISO 9001); 2.4 Food safety laws and regulations. **3.0 Theories** The person performing this task must be able to explain the following:

	3.1 Knowledge of testing laboratory management; 3.2 Compilation procedures for original records and testing reports; 3.3 Rounding off theory of significant figures. **4.0 Essential Skills** 4.1 Communication and contingency ability; 4.2 Accountability and patience; 4.3 Teamwork skills; 4.4 Management capabilities; 4.5 Summarizing ability; 4.6 Computer application skills.
DESCRIPTION ON THE END PRODUCT / SERVICE	Review original testing records and testing reports according to standards and specifications.
DETAILED KNOWLEDGE:	**Detailed Knowledge About:** 1. Laboratory safety operation methods; 3. Instrument and equipment safety operation; 3. Occupational health and safety; 4. Common technical specifications for food inspection; 5. International system of units and its application.

OCCUPATION	FOOD INSPECTION AND TESTING ENGINEER	**OCCUPATION CODE**	
DUTY TITLE	RECORD AND REPORT REVIEW	**DUTY NO.**	**706**
TASK TITLE	RESULT ANALYSIS AND CONFORMITY ASSESSMENT	**TASK NO.**	**7062**
PERFORMANCE CRITERIA	The person performing this task must be able to analyze the original test record results and assess their conformity according to standards and specifications, ensuring the accuracy of the test results and conclusions		
RANGE STATEMENT	This task may be carried out in the laboratory under the supervision of a senior food inspection and testing engineer. The following equipment and tools will be required in performing the task: 1. Original testing record; 4. Task assignment; 5. Uncertainty report; 6. Computer.		

EVIDENCE REQUIREMENTS

PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Verify the correctness of the sampling form; 2. Confirm that the sample preparation meets the requirements of the testing method; 3. Check the compatibility between inspection methods and judgment standards; 4. Analyze the effectiveness of testing results through quality control results; 5. Analyze the reasonableness of judgment basis application; 6. Confirm the uncertainty of the test results for critical value and the agreement on conformity assessment in the test contract; 7. Confirm the correspondence between the single test conclusion and the report conclusion; 8. Confirm the standardization of the testing conclusion format; 9. Confirm the consistency between the testing conclusion and the requirements of the task assignment.	**Detailed Knowledge About:** **1.0Methods** The person performing this task must be able to explain how to: 1.1 Perform sampling; 1.2 Prepare samples; 1.3 Test samples; 1.4 Design quality control methods; 1.5 Issue reports; 1.6 Analyze test results; 1.7 Determine test results. **2.0Principles** The person performing this task must be able to explain the following principles: 2.1 Compatibility between testing methods and judgment standards; 2.2 Correspondence between the single test conclusion and the report conclusion; 2.3 Confidentiality of testing results and conclusions; 2.4 Accreditation Criteria for the Competence of Testing and Calibration Laboratories (ISO/IEC 17025); 2.5 Quality Management System (ISO 9001); 2.6 Product execution standards; 2.7 Testing method standards; 2.8 Food safety laws and regulations.

	3.0 Theories The person performing this task must be able to explain th e following: 3.1 Knowledge of testing laboratory management; 3.2 Measurement method for uncertainty of inspection re sults; 3.3 Contract review; 3.4 Product standards. **4.0 Essential Skills** 4.1 Communication ability; 4.2 Teamwork skills; 4.3 Management capabilities; 4.4 Summarizing ability; 4.5 Computer application skills.
DESCRIPTION ON THE END PRO DUCT / SERVICE	Analysis of test report results and conclusion judgment.
DETAILED KNOWLEDGE:	**Detailed Knowledge About:** 1. Basic operating regulations for laboratory safety; 2. Safe and standardized operation of equipment; 3. Food quality and safety; 4. Testing laboratory management; 5. Occupational health and safety.

OCCUPATION	FOOD INSPECTION AND TESTING ENGINEER	**OCCUPATION CODE**	
DUTY TITLE	EXTERNAL TESTING QUALITY CONTROL	**DUTY NO.**	**707**
TASK TITLE	EVALUATION OF UNCERTAINTY OF TESTING METHOD	**TASK NO.**	**7071**
PERFORMANCE CRITERIA	The person performing this task shall be able to analyze and evaluate the measurement uncertainty in the testing process according to the relevant testing methods under the supervision of senior food inspection and testing engineers, so as to ensure the reliability of the testing results		
RANGE STATEMENT	This task may be carried out in a food testing laboratory under the supervision of a senior food inspection and testing engineer. The following equipment and tools will be required in performing the task: 1. Testing method operation instructions 2. Testing consumables, instruments and equipment: pipette, filter membrane, sample bottle, electronic balance, chromatograph, spectrometer, solid-phase extraction device, etc. 3. Personal Protective Equipment (PPE): goggles, gloves, work clothes, etc. 4. Computer		

EVIDENCE REQUIREMENTS

PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Take occupational health and safety precautions when performing the task; 2. Determine the standard operating procedures for testing items and specify the measurements to be taken; 3. Conduct inspection according to standard procedures; 4. Establish a mathematical model based on the testing procedures; 5. Identify the source of measurement uncertainty in the testing process; 6. Quantify the uncertainty components based on different statistical models; 7. Calculate the combined uncertainty; 8. Report uncertainty; 9. Evaluate uncertainty; 10. Dispose of wastes; 11. Clean tools, equipment and workplace.	**Detailed Knowledge About:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Evaluate testing uncertainty measured; 1.2 Identify the source of testing uncertainty; 1.3 Quantify the uncertainty components; 1.4 Evaluate measurement uncertainty. **2.0 Principles** The person performing this task must be able to explain the following principles: 2.1 Good Laboratory Practice (GLP); 2.2 Accreditation Criteria for the Competence of Testing and Calibration Laboratories (ISO/IEC 17025). **3.0 Theories** The person performing this task must be able to explain the following: 3.1 Guide to the Expression of Uncertainty in Measurement (ISO/IEC Guide 98-3); 3.2 International Vocabulary of Metrology (ISO/IEC Guide 99);

	3.3 Knowledge of food inspection and testing; 3.4 Analysis of the source of measurement uncertainty in testing; 3.5 Evaluation method for measurement uncertainty. **4.0 Essential Skills** 4.5 Computer application skills; 4.2 Data processing and analysis skills; 4.3 Communication skills; 4.4 Customer service skills; 4.5 Report writing skills. **5.0 Math skills** 5.1 Mathematical statistics skills.
DESCRIPTION ON THE END PRODUCT / SERVICE	Evaluation of measurement uncertainty of a testing method.
DETAILED KNOWLEDGE:	**Detailed Knowledge About:** 1. Occupational health and safety; 2. Basic operation for laboratory safety; 3. Specifications for safe and standardized operation of equipment; 4. Analytical chemistry; 5. Testing laboratory management; 6. Disposal of laboratory waste.

OCCUPATION	FOOD INSPECTION AND TESTING ENGINEER	**OCCUPATION CODE**	
DUTY TITLE	EXTERNAL TESTING QUALITY CONTROL	**DUTY NO.**	**707**
TASK TITLE	PARTICIPATE IN EXTERNAL QUALITY CONTROL ACTIVITIES	**TASK NO.**	**7072**
PERFORMANCE CRITERIA	The person performing this task must be able to participate in external quality control under the supervision of a senior food inspection and testing engineer, in accordance with relevant laboratory procedures and quality control plans, to ensure the effectiveness of laboratory testing results		
RANGE STATEMENT	This task may be carried out in a food testing laboratory under the supervision of a senior food inspection and testing engineer. The following equipment and tools will be required in performing the task: 1. External quality control plan 2. Operation procedure for testing method 3. Operation instructions for external quality control items 4. Testing reagents and consumables, instruments and equipment: pipette, filter membrane, sample bottle, electronic balance, chromatograph, spectrometer, solid-phase extraction device, etc. 5. Personal Protective Equipment (PPE): goggles, gloves, work clothes, etc. 6. Computer		

EVIDENCE REQUIREMENTS

PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Take occupational health and safety precautions when performing the task; 2. Complete external quality control item testing according to standard testing procedures; 3. Design a quality control plan to ensure the effectiveness of testing results; 4. Submit the report of external quality control testing results; 5. Follow up processing of external quality control results; 6. Dispose of wastes; 7. Clean tools, equipment and workplace.	**Detailed Knowledge About:** **1.0Methods** The person performing this task must be able to explain how to: 1.1 Perform competency verification; 1.2 Conduct measurement audits; 1.3 Perform inter laboratory comparisons; 1.4 Conduct on-site labeling or blind sample assessment; 1.5 Follow up external quality control results. **2.0 Principles** The person performing this task must be able to explain the following principles: 2.1 Good Laboratory Practice (GLP); 2.2 Accreditation Criteria for the Competence of Testing and Calibration Laboratories (ISO/IEC 17025). **3.0 Theories** The person performing this task must be able to explain

	the following: 3.1 Knowledge of food inspection and testing; 3.2 Methods to ensure the effectiveness of results; 3.3 Competency verification; 3.4 Measurement audits; 3.5 Inter laboratory comparisons. **4.0 Essential Skills** 4.1 Testing skills; 4.2 Experiment design skills; 4.3 Data processing and analysis skills; 4.4 Report preparation skills; 4.5 Communication skills. **5.0 Math skills** 5.1 Mathematical statistics skills
DESCRIPTION ON THE END PRODUCT / SERVICE	Complete external quality control according to the external quality control plan.
DETAILED KNOWLEDGE:	**Detailed Knowledge About:** 1. Occupational health and safety; 2. Basic operation for laboratory safety; 3. Specifications for safe and standardized operation of instruments; 4. Analytical chemistry; 5. Testing laboratory management; 6. Disposal of laboratory waste.

OCCUPATION	FOOD INSPECTION AND TESTING ENGI NEER	**OCCUPATION CODE**	
DUTY TITLE	EXTERNAL TESTING QUALITY CONTR OL	**DUTY NO.**	**707**
TASK TITLE	PARTICIPATE IN INTERNAL AUDITS	**TASK NO.**	**7073**
PERFORMANCE C RITERIA	The person performing this task must be able to conduct internal audits of t he testing laboratory according to the laboratory management system and i nternal audit plan under the supervision of a senior food inspection and test ing engineer, to ensure the effective implementation and maintenance of th e management system		
RANGE STATEMEN T	This task may be carried out in a food testing laboratory and office under t he supervision of a senior food inspection and testing engineer. The following equipment and tools will be required in performing the task: 1. Document for laboratory management system; 2. Laboratory internal audit scheme and plan; 3. Checklist for evaluating management system elements; 4. Internal audit process record form: Non-conformance record form, cor rective action record form, etc; 5. Laboratory quality records; 6. Laboratory technical records; 7. Laboratory equipment and consumables.		

EVIDENCE REQUIREMENTS

PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be a ble to do the following: 1. Understand the management system document; 2. Consult materials to identify key poin ts of internal audit; 3. Prepare an internal audit checklist; 4. Prepare an internal audit process reco rd form; 5. Conduct internal audits on the collect ion of evidence for elements of the m anagement system; 6. Communicate with the audited party and audit team leader during the inter nal audit; 7. Fill in internal audit records; 8. Give non-conformance items in inter nal audit; 9. Observe corrective measures for non-conformance.	**Detailed Knowledge About:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Understand the internal audit scheme and plan; 1.2 Prepare internal audit forms; 1.3 Identify key points of internal audit; 1.4 Implement internal audit plan; 1.5 Supervise the rectification and verification of non-conformance. **2.0 Principles** The person performing this task must be able to explain the following principles: 2.1 Sampling audit; 2.2 Randomness and systematicness of sampling; 2.3 Finding compliance; 2.4 Quality Management Systems - Fundamentals and Vocabulary (ISO 9000); 2.5 Guidelines for Auditing Management System (ISO 19011); 2.6 Accreditation Criteria for the Competence of Testi

	ng and Calibration Laboratories (ISO/IEC 17025). **3.0 Theories** The person performing this task must be able to explain the following: 3.1 Knowledge of quality management system in testin g laboratories; 3.2 Internal audit criteria; 3.3 Internal audit skills. **4.0 Essential Skills** 4.1 Comprehensive analysis and processing skills; 4.2 Objective evaluation skills; 4.3 Management skills; 4.4 Communication skills.
DESCRIPTION ON THE END PROD UCT / SERVICE	Implement internal audits according to the laboratory m anagement system and internal audit plan.
DETAILED KNOWLEDGE:	**Detailed Knowledge About:** 1. Occupational health and safety; 2. Basic operation for laboratory safety; 3. Specifications for safe and standardized operation o f instruments; 4. Quality management system; 5. Testing laboratory management; 6. Disposal of laboratory waste.

OCCUPATION	FOOD INSPECTION AND TESTING ENGINEER	**OCCUPATION CODE**	
DUTY TITLE	CONFIRMATION OF TESTING METHOD	**DUTY NO.**	**708**
TASK TITLE	CONFIRMATION OF NON-STANDARD METHODS	**TASK NO.**	**7081**
PERFORMANCE CRITERIA	The person performing this task must be able to confirm non-standard methods in accordance with the testing method management procedures and testing method confirmation procedures		
RANGE STATEMENT	This task may be carried out in the laboratory under the supervision of a senior food inspection and testing engineer. The following equipment and tools will be required in performing the task: 1. Testing method confirmation procedures; 2. Instrument operating manual; 3. Testing reagents and consumables, instruments and equipment: pipette, filter membrane, sample bottle, electronic balance, chromatograph, spectrometer, solid-phase extraction device, etc; 4. Personal Protective Equipment (PPE): goggles, gloves, work clothes, etc; 5. Computer.		

EVIDENCE REQUIREMENTS

ACTUAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Take occupational health and safety precautions when performing the task; 2. Confirm the category of non-standard testing methods; 3. Personnel allocation and collaboration for non-standard testing methods; 4. Confirmation of characteristic quantity of non-standard testing method (including but not limited to): measurement uncertainty of test results, detection limit, precision, recovery rate, method selectivity, working curve linearity and correlation coefficient, repeatability limit and reproducibility limit, applicable concentration range and sample matrix, typical sample test, etc; 5. Confirmation and validation of non-standard testing methods in the	**Detailed Knowledge About:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Confirm characteristic quantities of non-standard testing methods; 1.2 Validate non-standard testing methods within and between laboratories; 1.3 Evaluate the uncertainty. **2.0 Principles** The person performing this task must be able to explain the following principles: 2.1 Good Laboratory Practice (GLP); 2.2 Accreditation Criteria for the Competence of Testing and Calibration Laboratories (ISO/IEC 17025); 2.3 Laboratory biosafety standards. **3.0 Theories** The person performing this task must be able to explain the following: 3.1 Knowledge of analytical chemistry; 3.2 Microbiological test procedure;

laboratory (certified standard material labeling recovery, comparison with results obtained from other testing methods, etc.); 6. Confirmation and validation of non-standard testing methods between laboratories (inter laboratory comparison, participation in ability verification, or measurement review); 7. Evaluation of uncertainty; 8. Fill in the original testing records and relevant records and reports; 9. Dispose of wastes; 10. Clean tools, equipment and work place.	3.3 Operating procedures for instrument analysis. **4.0 Essential Skills** 4.1 Data processing and rounding off skills; 4.2 Statistical analysis skills; 4.3 Report writing skills; 4.4 Computer application skills.
DESCRIPTION ON THE END PRODUCT / SERVICE	Conduct methodological validation and confirmation of non-standard testing items according to the requirements of the confirmation specification for non-standard testing methods.
DETAILED KNOWLEDGE:	**Detailed Knowledge About:** 1. Occupational health and safety; 2. Basic operation for laboratory safety; 3. Specifications for safe and standardized operation of equipment; 4. Disposal of laboratory waste; 5. Testing laboratory management.

OCCUPATION	FOOD INSPECTION AND TESTING ENGINEER	**OCCUPATION CODE**	
JOB TITLE	CONFIRMATION OF TESTING METHOD	**DUTY NO.**	**708**
TASK NAME	PREPARE METHOD CONFIRMATION REPORT	**TASK NO.**	**7082**
PERFORMANCE CRITERIA	The person performing this task must be able to prepare method confirmation reports for newly confirmed methods in accordance with the testing method management procedures and testing method confirmation procedures		
RANGE STATEMENT	This task may be carried out in the laboratory under the supervision of a senior food inspection and testing engineer. The following equipment and tools will be required in performing the task: 1. Testing method confirmation procedures; 2. Computer; 3. Statistics and analysis software.		

EVIDENCE REQUIREMENTS

ACTUAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Design the format of method confirmation report; 2. Specify who will participate in method confirmation; 3. Specify the process and conclusion of resource demand verification (instruments and reagents, standard solution, conditions, sample treatment, etc.); 4. Specify the process and conclusions for determining method performance (selection and optimization of conditions, accuracy, precision, linearity, sensitivity, specificity, typical sample testing, graphs, tables, etc.); 5. Specify the test results of typical sample determination; 6. Specify the laboratory comparison process and conclusions of non-standard methods; 7. Specify the inter-laboratory comparison process and conclusions of non-standard methods; 8. Prepare original record forms; 9. Add original data record form or f	**Detailed Knowledge About:** **1.0Methods** The person performing this task must be able to explain how to: 1.1 Prepare method confirmation report 1.2 Prepare original testing records **2.0 Principles** The person performing this task must be able to explain the following principles: 2.1 Good Laboratory Practice (GLP) 2.2 Methodology validation principles 2.3 Accreditation Criteria for the Competence of Testing and Calibration Laboratories (ISO/IEC 17025) **3.0 Theories** The person performing this task must be able to explain the following: 3.1 Procedures for testing laboratory management **4.0 Essential Skills** 4.1 Data processing and rounding off skills 4.2 Statistical analysis skills 4.3 Report writing skills 4.4 Computer application skills

igure; 10. Summarize and confirm conclusi ons (specify whether the require ments are met); 11. Specify the identification and dat es of reviewers and approvers.	**5.0 Math skills** 5.1 Mathematical statistics skills.
DESCRIPTION ON THE END PR ODUCT / SERVICE	Prepare confirmation report of non-standard testing method according to the requirements of the confirmation specificat ion for non-standard testing methods.
DETAILED KNOWLEDGE:	**Detailed Knowledge About:** 1. Occupational health and safety; 2. Basic operating regulations for laboratory safety; 3. Specifications for safe and standardized operation of in struments; 4. Quality management system; 4. Analytical chemistry; 6. Disposal of laboratory waste.

OCCUPATION	FOOD INSPECTION AND TESTING ENGINEER	**OCCUPATION CODE**	
DUTY TITLE	LABORATORY SAFETY MANAGEMENT	**DUTY NO.**	**709**
TASK TITLE	DEVELOP LABORATORY SAFETY MANAGEMENT SYSTEM	**TASK NO.**	**7091**
PERFORMANCE CRITERIA	The person performing this task shall understand the safety knowledge of the testing laboratory and establish the laboratory safety system under the supervision of senior food inspection and testing engineer according to the requirements of their job responsibilities		
RANGE STATEMENT	This task may be carried out in a food testing laboratory under the supervision of a senior food inspection and testing engineer. The following equipment and tools will be required in performing the task: 1. Standard operating procedures and manual for laboratory safety management; 2. Personal Protective Equipment (PPE): goggles, gloves, work clothes, rubber shoes, etc; 3. Computer.		

EVIDENCE REQUIREMENTS

PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Establish an organizational structure and responsibilities for laboratory safety management; 2. Develop a safety management system for the laboratory; 3. Develop emergency preparedness and response mechanisms for the laboratory; 4. Establish a laboratory hazard identification and risk assessment mechanism, and establish corresponding safety management systems for electrical, mechanical, and chemical factors; 5. Establish personnel safety awareness, ability, and qualification evaluation methods, with a comprehensive personnel training and management system.	**Detailed Knowledge About:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Establish an organization and responsibilities for laboratory safety management; 1.2 Plan the structure and functions of the laboratory safety management system; 1.3 Identify laboratory hazards; 1.4 Develop protective measures and measures; 1.5 Develop emergency preparedness and response mechanisms for the laboratory; 1.6 Develop methods for selecting, training, and hiring laboratory safety management personnel. **2.0 Principles** The person performing this task must be able to explain the following principles: 2.1 Good Laboratory Practice (GLP); 2.2 Accreditation Criteria for the Competence of Testing and Calibration Laboratories (ISO/IEC 17025). **3.0 Theories** The person performing this task must be able to explain the following: 3.1 Elements for laboratory safety management;

	3.2 Structure and function of food analysis and testing laboratory; 3.3 Laboratory hazards; 3.4 Handling methods for common laboratory safety issues. **4.0 Essential Skills** 4.1 Contingency ability; 4.2 Communication skills; 4.3 Ability to solve problems.
DESCRIPTION ON THE END PRODUCT / SERVICE	Establish a laboratory safety management system based on general safety requirements for testing laboratories and specific standards for food testing laboratories.
DETAILED KNOWLEDGE:	**Detailed Knowledge About:** 1. Occupational safety and health; 2. Laboratory safety operation; 3. Instrument and equipment safety operation; 4. Establishment, operation, supervision and improvement; of laboratory safety management system; 5. Potential hazards in the laboratory and emergency response methods; 6. Disposal method of laboratory wastes.

OCCUPATION	FOOD INSPECTION AND TESTING ENGINEER	**OCCUPATION CODE**	
DUTY TITLE	LABORATORY SAFETY MANAGEMENT	**DUTY NO.**	**709**
TASK TITLE	CONDUCT LABORATORY SAFETY MANAGEMENT TRAINING	**TASK NO.**	**7092**
PERFORMANCE CRITERIA	The person performing this task shall organize laboratory safety management training under the supervision of senior food inspection and testing engineers in accordance with laboratory management standards and safety management manuals		
RANGE STATEMENT	This task may be carried out in a food testing laboratory under the supervision of a senior food inspection and testing engineer. The following equipment and tools will be required in performing the task: 1. Standard operating procedures and manual for laboratory safety management; 2. Training manual; 3. Evaluation and assessment methods; 4. Computer.		

EVIDENCE REQUIREMENTS

PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Determine the persons who need to be trained; 2. Determine the training tasks and expected goals; 3. Determine the place for training; 4. Determine training content; 5. Organize training; 6. Evaluate the training effectiveness; 7. Clean workplaces.	**Detailed Knowledge About:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Develop a laboratory safety training plan; 1.2 Implement laboratory safety training plan; 1.3 Evaluate the effectiveness of laboratory safety training. **2.0 Principles** The person performing this task must be able to explain the following principles: 2.1 Implementation measures for laboratory safety management; 2.2 Procedures for laboratory safety management training. **3.0 Theories** The person performing this task must be able to explain the following principles: 3.1 Knowledge of testing laboratory management; 3.2 Content of laboratory safety management rules and regulations. **4.0 Essential Skills** 4.1 Contingency ability; 4.2 Communication skills; 4.3 Ability to solve problems.

DESCRIPTION ON THE END PRODUCT / SERVICE	Conduct laboratory safety management training in accordance with the laboratory management system and manual.
DETAILED KNOWLEDGE:	**Detailed Knowledge About:** 1. Establishment, operation, supervision and improvement of laboratory safety management system; 2. Potential hazards in the laboratory and emergency response methods; 3. Occupational safety and health.

OCCUPATION	FOOD INSPECTION AND TESTING ENGINEER	**OCCUPATION CODE**	
DUTY TITLE	LABORATORY SAFETY MANAGEMENT	**DUTY NO.**	**709**
TASK TITLE	ORGANIZE LABORATORY FIRE SAFETY EMERGENCY DRILLS	**TASK NO.**	**7093**
PERFORMANCE CRITERIA	The person performing this task must complete the identification of laboratory hazards and harmful factors according to the laboratory fire safety emergency plan, propose safety technology and safety management strategies, and conduct fire safety drills for the laboratory personnel under the supervision of a senior food inspection and testing engineer		
RANGE STATEMENT	This task may be carried out in a food testing laboratory under the supervision of a senior food inspection and testing engineer. The following equipment and tools will be required in performing the task: 1. Standard operating procedures and manual; 2. Personal Protective Equipment (PPE): goggles, gloves, work clothes, rubber shoes, respiratory mask, fire shield, etc; 3. Computer.		

EVIDENCE REQUIREMENTS

PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Organize learning of laboratory fire safety emergency plans; 2. Conduct mobilization and personnel allocation, including the commander in chief, deputy commander in chief, on-site preparation personnel, and specify the roles and responsibilities of personnel participating in the drill; 3. Prepare equipment and materials for emergency drills, including but not limited to dry powder fire extinguishers, 1 dedicated stretcher, protective clothing, masks, first aid kits, escape tools, and warning tapes; 4. Organize special practical exercises for all personnel: special learning and training on the use of alarms, power cut off, fire extinguishers, gas masks, alarm receiving, self rescue and escape, etc; 5. Determine the drill time; 6. Organize all personnel to simulate and deal with gas poisoning and high temperature burn accide	Detailed Knowledge About: **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Identify potential hazards and harmful factors in the laboratory; 1.2 Take protective measures; 1.3 Use emergency response methods; 1.4 Dispose of wastes at accident sites. **2.0 Principles** The person performing this task must be able to explain the following principles: 2.1 Characteristics of hazards and harmful factors; 2.2 Hazard factors and hazard degree; 2.3 Protection measures for hazard factors; 2.4 Selection order of risk control. **3.0 Theories** The person performing this task must be able to explain the following: 3.1 Laboratory safety management rules and regulations; 3.2 Identification of laboratory hazards; 3.3 Common accident handling methods of laboratory; 3.4 Disposal method of wastes. **4.0 Essential Skills** 4.1 Contingency ability;

nts, acid and alkali burn accidents, initial fire accidents in the laboratory, and organize emergency evacuation; 7. Confirm that the on-site personnel are completely out of danger and the danger is under control, and announce the end of the emergency drill; 8. Summarize the causes of accidents, lessons learned, problems during the drills, and corrective measures; 9. Clean up the drill site, de-alert, restore power and water supply, pick up fire equipment, rescue supplies, and other emergency supplies on site, and return personnel to their work positions; 10. Write an evaluation report on laboratory fire safety emergency drills; 11. Organize and save the images, photos, and attendance forms of the drill site; 12. Propose safety technology response measures based on risk assessment; 13. Evaluate existing risk control measures; 14. Handle emergency at accident sites; 15. Carry out rescue activities according to the accident emergency plan; 16. Provide safety training for experiment personnel; 17. Demonstrate accident handling methods; 18. Dispose of wastes reasonably.	4.2 Communication skills; 4.3 Ability to solve problems; 4.4 Emergency accident handling skills.
DESCRIPTION ON THE END PRODUCT / SERVICE	Organize laboratory fire safety drills according to standards of food testing laboratories.
DETAILED KNOWLEDGE:	**Detailed Knowledge About:** 1. Establishment, operation, supervision and improvement of laboratory safety management system; 2. Potential hazards in the laboratory and emergency response methods; 3. Occupational safety and health.

TABLE 1: DACUM CHARTS FOR FOOD INSPECTION AND TESTING ENGINEER - NT A 7

DUTIES	TASKS	ENABLERS
1.0 Sampling management	1.1 Prepare sampling operation instructions	**Generic Skills and Knowledge** . Standardized sampling skills . Food testing skills . Risk identification and troubleshooting skills . Data processing and analysis skills . Skill of developing plans and schemes . Summarizing skills . Report writing skills . Communication and contingency skills . Customer service skills . Management skills . Computer application skills . Knowledge of different sampling methods . Knowledge of sampling transportation management . Knowledge of testing laboratory management . Knowledge of occupational health and safety **Tools and Equipment** . Sampling plan . Sampling scheme . General rules for food sampling inspection . Measures for food safety sampling management . Annual plan for superior food safety sampling inspection . Results of preliminary food safety testing . Quality control plan for products requiring special attention . Food safety risk monitoring plans at all levels . Sampling results of food safety testing . Camera . Computer
	1.2 Develop sampling plans and schemes	
	1.3 Conduct risk assessment of sampling	

		Materials . Paper, highlighter, marker, signing pen, recording pen **Requirements for Employees** . Teamwork . Communication skills . Integrity and confidentiality . Time management and Accountability . Adhere to professional ethics
2.0 Sample management	2.1 Develop sample management procedures 2.2 Prepare sample preparation operation instructions 2.3 Prepare sample management operation instructions	**Generic Skills and Knowledge** . Sample management skills . Sample preparation skills . Summarizing skills . Ability to analyze and solve problems . Skill of developing plans and schemes . Communication and contingency skills . Computer application skills . Laboratory sample management methods . Food sample preparation, circulation, and preservation methods . Knowledge of testing laboratory management . Food safety laws and regulations **Tools and Equipment** . Assignment for testing tasks . Product execution standard . Standard for testing methods . Sample management procedures . Management procedure for inspection items and articles . Control procedure for facility and environmental condition . Computer **Materials** . Paper and pen **Requirements for Employees**

		. Teamwork . Trustworthy . Integrity and confidentiality . Time management and Accountability . Adhere to professional ethics
3.0 Large instrument and equipment management	3.1 Procurement and acceptance of large instruments and equipment	**Generic Skills and Knowledge** . Communication and cooperation . Computer application skills . Operation skills of large instruments . Writing skills . Data statistics and processing capabilities . Ability to analyze data results . Knowledge of testing laboratory instrument management . Knowledge of food inspection and testing . Knowledge of instrument analysis . Knowledge of using and maintaining large instruments . Basic operating knowledge for laboratory safety . Knowledge for safe and standardized operation of equipment . Knowledge of occupational health and safety . Knowledge of disposal of laboratory wastes **Tools and Equipment** . Local authority's standard on food . Operating procedures for instrument and equipment . Instrument operating manual . Equipment procurement and acceptance procedure . Metrological traceability procedure and intermediate check procedure . Instrument and equipment usage management procedure . Chromatographic, spectral and mass spectrometric instruments, filtration devices, solid phase extraction devices, rotary evaporator, termovap sample concentrator, and other relev
	3.2 Metrological traceability and intermediate check of large instruments and equipment	
	3.3 Management and maintenance of large instruments and equipment	
	3.4 Training for use of large instruments and equipment	

		ant instruments and equipment . Personal protective equipment such as goggles, protective clothing, gloves, etc. . Computer **Materials** . Reagents, filter membranes, sample bottles, pipettes, Volumetric flask and other related experimental reagents and consumables . Experimental reference materials **Requirements for Employees** . Teamwork . Objectivity and impartiality . Dedication . Honesty and trustworthiness . Time management and Accountability . Adhere to professional ethics
4.0 Mass spectrometry detection	4.1 Mass spectrometry analysis 4.2 Method improvement and optimization 4.3 Implement re-testing	**Generic Skills and Knowledge** . Using communication skills to communicate with service recipients . Computer application skills . Operation skills of large instruments . Writing skills . Data statistics and processing capabilities . Ability to analyze data results . Ability to find and solve problems . Knowledge of testing laboratory instrument management . Knowledge of food inspection and testing . Knowledge of instrument analysis principle . Knowledge of using and maintaining large instruments . Basic operating knowledge for laboratory safety . Knowledge of safe and standardized operation of equipment . Knowledge of occupational health and safety . Knowledge of disposal of laboratory wastes

		Tools and Equipment . Local authority's standard on food . Standard testing operating procedures . Instrument operating manual . Testing method validation procedures . Test result management procedures . Mass spectrometric instruments, filtration devices, solid phase extraction devices, rotary evaporator, termovap sample concentrator, and other relevant instruments and equipment . Personal protective equipment such as goggles, protective clothing, gloves, etc. . Computer **Materials** . Reagents, filter membranes, injection bottles, pipettes, Volumetric flask and other related reagents and consumables . Experimental reference materials **Requirements for Employees** . Teamwork . Objectivity and impartiality . Dedication . Honesty and trustworthiness . Time management and Accountability . Adhere to professional ethics
5.0 Pathogenic bacteria detection	5.1 Common pathogenic bacteria detection	**Generic Skills and Knowledge** . Microbial testing skills . Experiment design skills . Data processing and analysis skills . Summarizing skills . Objective evaluation skills . Report writing skills . Management skills . Communication skills . Customer service skills . Knowledge related to food microbiology
	5.2 Acceptance and quality control of culture medium	

		• Knowledge of food inspection and t esting • Knowledge of testing laboratory ma nagement • Knowledge of quality management system • Basic operating knowledge for labo ratory safety • Biological safety operation knowled ge • Knowledge of safe and standardize d operation of equipment • Knowledge of occupational health a nd safety • Knowledge of disposal of laborator y wastes • Operating procedures for pathogeni c bacteria detection **Tools and Equipment** • Local authority's standard on food • • Operation instruction for training m edium acceptance and quality contr ol • Document for laboratory manageme nt system • Laboratory quality records and tech nical records • Refrigerator, ultra clean workbench, biosafety cabinet, incubator, autocl ave, thermostatic incubator, microsc ope, homogenizer, oscillator, comp uter, other relevant instruments and equipment • Personal protective equipment such as goggles, sterile White coat, hats, gloves, masks, shoe covers, etc. • Computer **Materials** • Alcohol burner, scissors, tweezers, sterilized alcohol, petri dish, straw, pipette, inoculating loop, conical fla sk, and other materials required for the experiment • Corresponding standard strains • Original record

		• Paper and pen **Requirements for Employees** • Teamwork • Good at communication • Honesty and trustworthiness • Rigorous, meticulous and adhering to standards • Dedication • Hardworking • Time management and Accountability
6.0 Record and report review	6.1 Review of original records and testing reports	**Generic Skills and Knowledge** • Sampling skills • Food testing skills • Testing process quality control and evaluation skills • Data processing and analysis skills • Highly sensitive to data • Summarizing skills • Management skills • Teamwork • Communication and contingency skills • Computer application skills • Knowledge of testing laboratory management • Knowledge of uncertainty of inspection results • Knowledge of contract review • International System of Units and its application • Rounding off theory of significant figures • Compilation procedures for original records and testing reports • Knowledge of laboratory safety and occupational health **Tools and Equipment** • Original testing record • Product execution standard • Standard for testing methods • Task assignment • Standard for report/certificate preparation • Uncertainty report
	6.2 Result analysis and conformity assessment	

		• Sampling form/commission form **Materials** • Paper and pen **Requirements for Employees** • Teamwork • Communication skills • Objectivity and impartiality • Dedication • Rigorous, meticulous and adhering to standards • Time management and Accountability
7.0 External testing quality control	7.1 Evaluation of uncertainty of testing method 7.2 Participate in external quality control activities 7.3 Participate in internal audits	**Generic Skills and Knowledge** • Testing skills • Experiment design skills • Sampling audit skills • Data processing skills • Summarizing skills • Objective evaluation skills • Report writing skills • Management skills • Communication skills • Customer service skills • Knowledge of analytical chemistry • Knowledge of food inspection and testing • Knowledge of testing laboratory management • Knowledge of quality management system • 3Methods to ensure the effectiveness of results • Internal audit guidelines and techniques • Knowledge of occupational health and safety • Basic operating knowledge for laboratory safety • Knowledge of safe and standardized operation of equipment • Knowledge of disposal of laboratory wastes **Tools and Equipment**

		• External quality control plan • Testing method operation instructions • Operation instructions for external quality control items • Document for laboratory management system • Laboratory internal audit scheme and plan • Checklist for evaluating management system elements • Internal audit process record form: Non-conformance record form, corrective action record form, etc. • Laboratory quality records and technical records • Electronic balance, chromatograph, spectrometer, solid-phase extraction device and other related instruments and equipment • Personal protective equipment such as goggles, protective clothing, gloves, etc. • Computer **Materials** • Reagent, pipette, volumetric flask, beaker, filter paper, membrane, sample bottle and other related reagent consumables • Experimental related standard products **Requirements for Employees** • Teamwork • Good at communication • Honesty and trustworthiness • Rigorous and meticulous • Adhere to regulations • Dedication • Time management and Accountability
8.0 Confirmation of testing method	8.1 Confirmation of non-standard methods 8.2 Prepare method confirmation report	**Generic Skills and Knowledge** • Testing skills • Experiment design skills • Data processing and analysis skills • Summarizing skills

		• Objective evaluation skills • Report writing skills • Management skills • Communication skills • Customer service skills • Knowledge of analytical chemistry • Related knowledge of methodology validation • Knowledge of testing laboratory ma nagement • Knowledge of quality management system • Basic operating knowledge for labo ratory safety • Knowledge for safe and standardize d operation of equipment • Knowledge of safe and standardize d operation of equipment • Knowledge of occupational health a nd safety • Knowledge of disposal of laborator y wastes • Method confirmation procedures **Tools and Equipment** • Local authority's standard on food • Pipette, filter membrane, sample bo ttle, electronic balance, chromatogr aph, spectrometer, solid-phase extra ction device, and other testing equip ment • Personal protective equipment such as goggles, protective clothing, glov es, etc • Data analysis software • Computer **Materials** • Reagents, pipette, filter membranes, sample bottles, filter paper, volume tric flask and other related reagents and consumables • Paper and pen **Requirements for Employees** • Teamwork • Communication skills

		• Trustworthy • Dedication • Rigorous, meticulous and adhering to standards • Time management and Accountability
9.0 Laboratory safety management	9.1 Develop laboratory safety management system 9.2 Conduct laboratory safety management training 9.3 Organize laboratory fire safety drill	**Generic Skills and Knowledge** • Communication skills • Management skills • Text editing and processing skills • Computer application skills • Firefighting equipment operation skills • Knowledge of laboratory safety and health • Knowledge of laboratory organization and structure • Safety requirements for laboratory water, electricity, gas, and fire • Method for formulating laboratory safety management documents • Emergency handling skills for laboratory accidents • Knowledge and skills for disposal of laboratory wastes **Tools and Equipment** • Local authority's standard on food • Laboratory safety management documents • Laboratory safety management record form • Laboratory safety training plan • Laboratory safety training assessment form • Laboratory safety drill plan • Personal protective equipment such as goggles, fire shields, gloves, masks, gas mask, rubber shoes, etc • Computer **Materials** • Warning posts, fire extinguishers, fire extinguishing sand, absorbent cotton and other safety firefighting equipment • Pen, paper

		Requirements for Employees • Teamwork • Good at communication • Trustworthy • Dedication • Time management and Accountability • Rigorous, meticulous and adhering to standards