



Australian Government

MSL974004 Perform food tests

Release: 1

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Modification History

Release 1. Supersedes and is equivalent to MSL974004A Perform food tests

Application

This unit of competency covers the ability to interpret food test requirements, prepare samples, conduct pre-use and calibration checks on equipment, and perform routine testing of raw food materials, in-process materials and final products. These tests will involve several measurement steps. The unit includes data processing and some interpretation of results and tracking of obvious test malfunctions where the procedure is standardised. However, personnel are not required to analyse data, optimise tests/procedures for specific samples or troubleshoot equipment problems where the solution is not apparent.

This unit of competency is applicable to laboratory or technical assistants and instrument operators working in the food and beverage processing industry sectors.

While no specific licensing or certification requirements apply to this unit at the time of publication, laboratory operations are governed by relevant legislation, regulations and/or external accreditation requirements. Local requirements should be checked.

Pre-requisite Unit

Nil

Competency Field

Testing

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

1	Interpret and schedule test requirements	1.1	Review test request to identify samples to be tested, test method and equipment/instruments involved
		1.2	Identify hazards and workplace controls associated with the sample, preparation/test methods, reagents and/or equipment
		1.3	Plan parallel work sequences to optimise throughput of multiple sets of samples

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| 2 | Receive and prepare food samples | <div>2.1 Log samples using standard operating procedures (SOPs)</div> <div>2.2 Record sample description, compare with specification and note and report discrepancies</div> <div>2.3 Prepare samples and standards in accordance with food testing requirements</div> <div>2.4 Ensure traceability of samples from receipt to reporting of results</div> |
| 3 | Check equipment before use | <div>3.1 Set up equipment/instruments in accordance with test method requirements</div> <div>3.2 Perform pre-use and safety checks in accordance with relevant workplace and operating procedures</div> <div>3.3 Identify faulty or unsafe components and equipment and report to appropriate personnel</div> <div>3.4 Check equipment calibration using specified standards and procedures</div> <div>3.5 Quarantine out-of-calibration equipment/instruments</div> <div>3.6 Ensure reagents required for the test are available and meet quality requirements</div> |
| 4 | Test samples to determine food components and characteristics | <div>4.1 Operate equipment/instruments in accordance with test method requirements</div> <div>4.2 Perform tests/procedures on all samples and standards in accordance with specified methods</div> <div>4.3 Shut down equipment/instruments in accordance with operating procedures</div> |
| 5 | Process data | <div>5.1 Record test data noting atypical observations</div> <div>5.2 Construct calibration graphs and compute results for all samples from these graphs</div> |

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| | | 5.3 | Ensure calculated values are consistent with reference standards and expectations |
| | | 5.4 | Estimate and document uncertainty of measurement in accordance with workplace procedures |
| | | 5.5 | Record and report results in accordance with workplace procedures |
| | | 5.6 | Interpret trends in data and/or results and report out-of-specification or atypical results promptly to appropriate personnel |
| | | 5.7 | Determine if basic procedure or equipment problems have led to atypical data or results |
| 6 | Maintain a safe work environment | 6.1 | Use established safe work practices and personal protective equipment (PPE) to ensure personal safety and that of other laboratory personnel |
| | | 6.2 | Minimise the generation of wastes and environmental impacts |
| | | 6.3 | Ensure the safe collection of laboratory and hazardous waste for subsequent disposal |
| | | 6.4 | Care for and store equipment and reagents as required |
| 7 | Maintain laboratory records | 7.1 | Enter approved data into laboratory information management system (LIMS) |
| | | 7.2 | Maintain confidentiality and security of workplace information and laboratory data |
| | | 7.3 | Maintain equipment and calibration logs in accordance with workplace procedures |

Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance.

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

Standards, codes, procedures and/or workplace requirements

Standards, codes, procedures and/or workplace requirements include the latest version of one or more of:

- Australian and international standards covering the requirements for the competence of testing and calibration laboratories, laboratory safety and quality management
- national work health and safety (WHS) standards and codes of practice, and national measurement regulations and guidelines
- standard methods for determining food components and characteristics
- specific codes, guidelines procedures and methods, such as:
 - Australia New Zealand Food Standards (ANZFS) Code
 - Royal Australian Chemical Institute (RACI) or American Association of Cereal Chemists (AACI) methods for colour, moisture, total ash, fats and proteins, nitrogen, fibre, microorganisms and viscosity
 - Australian code of good manufacturing practice for medicinal products (GMP), and principles of good laboratory practice (GLP)
- workplace documents, such as standard operating procedures (SOPs); quality and equipment manuals; calibration and maintenance schedules; material safety data sheets (MSDS) and safety procedures; material, production and product specifications; production and laboratory schedules; workplace recording and reporting procedures; and waste minimisation and safe disposal procedures
- Australian Quarantine and Inspection Service (AQIS) Export Control (Orders) Regulations and Import Guidelines
- gene technology regulation

Sample preparation processes

Sample preparation processes include one or more of:

- grinding and milling
- preparation of discs
- digestion, dissolving, extracting, refluxing and degassing
- washing, drying, ashing and temperature equilibration
- precipitation and centrifugation, filtration, flocculation and evaporation
- culturing of selected microorganisms

Food tests and procedures

Food tests and procedures include one or more of:

- sensory tests, such as appearance, taste, texture, colour and odour of foods, and browning (sugar content)
- visual tests, such as detection of sediments and scorched particles, foreign matter, damage to packaging and compatibility of packaging
- physical/mechanical tests, such as:
 - melting point, boiling point and freezing point
 - mass, volume, density, specific gravity and particle size, and homogenisation
 - rheology, viscosity and gel strength
 - dispersability, 'wetability' and 'whipability'
 - elasticity, hardness, compressibility and strength
 - starch quality
- chemical analysis, such as:
 - pH, conductivity and moisture content
 - solids, fats, proteins and carbohydrates
 - ash analysis and salt analysis
 - titratable acids, iodine values and peroxide values
 - enzyme activity
 - specific ions and active ingredients
- microbiological tests and procedures, such as:
 - isolation, detection, classification to genera and some species or microorganisms
 - enumeration and nomenclature of desirable/non-desirable microorganisms
 - propagation and maintenance of yeast, bacteria and cultures used in food processing
 - measurement of spoilage and contamination
 - sterility, hygiene and sanitation checks
- optical/spectrometric tests, such as ultraviolet-visible (UV-VIS), refractive index and optical rotation
- thermal tests, such as calorific values, stability of products and effectiveness of heat treatments

Tests

Tests include one or more methods for:

- control of starting materials, in-process materials and finished products
- health monitoring

- basic troubleshooting of production processes

Safe work practices

Safe work practices include:

- ensuring access to service shut-off points
- recognising and observing hazard warnings and safety signs
- labelling of samples and hazardous materials
- handling and storage for hazardous materials and equipment in accordance with labelling, MSDS and manufacturer instructions
- identifying and reporting operating problems or equipment malfunctions
- cleaning equipment and work areas regularly using workplace procedures
- using PPE, such as hard hats, hearing protection, gloves, safety glasses, coveralls and safety boots
- following established manual handling procedures
- reporting abnormal emissions, discharges and airborne contaminants, such as noise, light, solids, liquids, water/wastewater, gases, smoke, vapour, fumes, odour and particulates, to appropriate personnel

WHS and environmental management requirements

WHS and environmental management requirements include:

- complying with WHS and environmental management requirements at all times, which may be imposed through state/territory or federal legislation. These requirements must not be compromised at any time
- applying standard precautions relating to the potentially hazardous nature of samples
- accessing and applying current industry understanding of infection control issued by the National Health and Medical Research Council (NHMRC) and State and Territory Departments of Health, where relevant

Unit Mapping Information

Release 1. Supersedes and is equivalent to MSL974004A Perform food tests

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=5c63a03b-4a6b-4ae5-9560-1e3c5f462baa>

Assessment Requirements for MSL974004 Perform food tests

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Performance Evidence

Evidence of competence in this unit must satisfy all of the requirements of the elements and performance criteria, and include demonstration of:

- performing at least five (5) routine food tests or procedures involving several measurement steps
- interpreting food testing methods and procedures accurately
- preparing samples using at least three (3) different processes
- maintaining and evaluating reagents
- conducting pre-use and calibration checks on equipment, and quarantining out-of-calibration equipment and instruments
- safely operating test equipment and instruments to workplace standards and manufacturer specification
- processing data, interpreting gross features of data/results and making relevant conclusions
- preparing calibration graphs and calculating results using appropriate equations, units, uncertainties and precision
- identifying atypical results as either out-of-normal range or an artefact
- tracing and sourcing obvious causes of an artefact, tracking obvious test malfunctions for standardised procedures, and troubleshooting basic equipment and methods
- communicating problems to a supervisor or outside service technician
- recording and communicating results in accordance with workplace procedures
- maintaining security, integrity and traceability of samples, sub-samples, test data, results and documentation
- following workplace safety procedures

Knowledge Evidence

Must provide evidence that demonstrates knowledge of:

- principles and concepts underpinning the food tests or procedures performed, such as:
 - ions, atoms, molecules, bonding, affinities and related properties
 - chemical reactions (acid/base and compleximetric)
 - structure and properties of proteins, lipids, carbohydrates, vitamins and minerals
 - food additives, flavourings and essences
 - nutrient value of major food groups
 - interaction of water with food components

- microbiology, including incubation characteristics, selective media, growth stages of bacterial cultures and reference organisms
- microbiology of organisms with public health significance
- chemical and microbial changes in food
- food preservation techniques
- fermentation process
- packaging and controlled atmosphere
- elastic properties of materials and hardness
- cohesive/adhesive forces, fluid flow and viscosity
- changes of state, energy content and enthalpy change
- electromagnetic spectrum and absorption, emission and refraction of light
- quality control program for raw materials, process control and finished product inspection
- genetically modified foods
- purpose of the food tests or procedures conducted
- concepts of metrology, principles and concepts related to equipment and instrument operation and tests or procedures
- function of key components of the equipment/instrument used
- effects on the test of modifying equipment/instrument variables
- workplace and/or legal traceability requirements
- relevant hazards, work health and safety (WHS) and environment requirements.

Assessment Conditions

- Judgment of competence must be based on holistic assessment of the evidence. Assessment methods must confirm consistency of performance over time, rather than a single assessment event.
- This unit of competency is to be assessed in the workplace or a simulated workplace environment. A simulated workplace environment must reflect realistic operational workplace conditions that cover all aspects of workplace performance, including the environment, task skills, task management skills, contingency management skills and job role environment skills.
- Foundation skills are integral to competent performance of the unit and should not be assessed separately.
- Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.
- Knowledge evidence may be collected concurrently with performance evidence or through an independent process, such as workbooks, written assessments or interviews (provided a record is kept in each case).
- This unit of competency may be assessed with:
 - MSL924001 Process and interpret data
- Holistic assessment methods include:

- review of test data/results obtained by the candidate over a period of time to check accuracy, consistency and timeliness of results
- review of test records and workplace documentation completed by the candidate
- feedback from peers and supervisors
- observation of candidate conducting a range sample preparations and food tests and procedures
- oral or written questioning of food technology concepts and principles, food tests and procedures and workplace procedures.
- Access is required to instruments, equipment, materials, workplace documentation, procedures and specifications associated with this unit, including, but not limited to:
 - a standard laboratory equipped with test equipment, instruments, standards and materials
 - workplace procedures and standard methods
 - records, including:
 - test and calibration results
 - equipment use, maintenance and servicing history.
- Assessors must satisfy the assessor competency requirements that are in place at the time of the assessment as set by the VET regulator.
- The assessor must demonstrate both technical competence and currency.
- Technical competence can be demonstrated through:
 - relevant VET or other qualification/Statement of Attainment AND/OR
 - relevant workplace experience.
- Currency can be demonstrated through:
 - performing the competency being assessed as part of current employment OR
 - having consulted with a laboratory about performing the competency being assessed within the last twelve months.

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