



Australian Government

MSL973003 Prepare culture media

Release: 1

MSL973003 Prepare culture media

Modification History

Release 1. Supersedes and is equivalent to MSL973003A Prepare culture media

Application

This unit of competency covers the ability to prepare culture media which is free of contamination to facilitate optimal growth of organisms and cells. It includes the ability to organise the materials, equipment and work environment and follow standard methods. Media may be prepared from formulated powders obtained from microbiological companies or by first principles under supervision of a technical officer or scientist.

This unit of competency is applicable to laboratory assistants in the biomedical, biological, environmental, food processing and pharmaceutical 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	Prepare culture media	1.1	Prepare mixture of media and solvent to ensure solution and even settling of heat soluble materials
		1.2	Label media to allow tracking in subsequent processes
		1.3	Use a vessel large enough to endure adequate mixing and heating of the media
		1.4	Dispense media into vessels for sterilisation, leaving room for expansion during heating and cooling

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|---|---------------------------------------|---|
| 2 | Sterilise media | <div>2.1 Load the steriliser in keeping with maximum permitted loads and appropriate positioning of materials</div> <div>2.2 Ensure a sterilisation indicator is correctly placed with the load to monitor sterilisation process</div> <div>2.3 Operate sterilisation cycle in accordance with manufacturer requirements to achieve sterilisation at the required settings</div> <div>2.4 Cool media to the temperature specified in the media formulation procedures</div> |
| | | |
| 3 | Pour, label and store media | <div>3.1 Add labile constituents where necessary, under conditions that will not lead to their denaturation or contamination of media</div> <div>3.2 Ensure even mixing of additives and media before dispensing</div> <div>3.3 Aseptically dispense media to minimise occurrence of procedural contamination</div> <div>3.4 Label media to allow for selection, avoiding areas of the culture vessel required for examination of colony growth</div> <div>3.5 Store media to maximise shelf life and minimise contamination</div> <div>3.6 Date batch media to ensure correct batch rotation</div> <div>3.7 Incubate control plates as a sterility check</div> |
| | | |
| 4 | Perform quality control checks | <div>4.1 Inspect media for any evidence of possible contamination or problems with structure or sterilisation</div> <div>4.2 Check usability of selective media by growth of expected organism</div> <div>4.3 Check stored stocks at regular intervals for conformance to required standards</div> |
| | | |
| 5 | Maintain work area and | <div>5.1 Use personal protective equipment (PPE) and safe work practices to ensure personal safety and that of other</div> |

equipment to prevent cross-infection and contamination		laboratory personnel
	5.2	Place disposable and reusable items into relevant receptacles
	5.3	Clean and disinfect work area and equipment after use
	5.4	Transport disposable and reusable contaminated materials to relevant areas for disinfection, sterilisation and cleaning or disposal

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, quality management and environmental management • Australian standards covering the requirements for cleaning, disinfecting and sterilising reusable medical and surgical instruments and equipment; and maintenance of associated environments in health care facilities • national work health and safety (WHS) standards and codes of practice, national environmental protection measures, and national measurement regulations and guidelines • specific codes, guidelines and procedures, such as National Association of Testing Authorities (NATA) accreditation requirements, principles of good laboratory practice (GLP), Australia New Zealand Food Standards (ANZFS) Code, Australian code of good manufacturing practice for medicinal products (GMP) and Australian Dangerous Goods Code • workplace documents, such as standard operating procedures

(SOPs); quality and equipment manuals; calibration and maintenance schedules; material safety data sheets (MSDS); safety procedures; material, client and product specifications; production and laboratory schedules; workplace recording and reporting procedures; and waste minimisation and safe disposal procedures

- workplace procedures and standard methods for preparing culture media, and operation and maintenance manuals for automated media preparation equipment

Cell and tissue culture media

Cell and tissue culture media include, but are not limited to, one or more of:

- agars, broths and solutions
- slopes
- basic balanced salt solutions, such as Hank's or Krebs-Ringer's
- deeps
- enriched media, such as blood sugar, chocolate agar, tetrathionate broth and selenite broth
- control media
- differential media, such as eosin-methylene blue agar and MacConkey's agar
- selective media, such as deoxycholate-citrate agar and Lowenstein-Jensen medium
- tissue culture media
- labile constituents, such as blood, hormones or antibodies

Sterilisation techniques

Sterilisation techniques include, but are not limited to, one or more of:

- boiling, high temperature, high pressure steam and autoclaving
- steam and membrane filtration
- microwave, radiation, gas and/or chemical treatments

Safety procedures

Safety procedures include, but are not limited to, one or more of:

- use of PPE, such as safety glasses, gloves and coveralls
- use of biohazard containers and laminar flow cabinets
- correctly labelling reagents and hazardous materials
- handling and storing hazardous material and equipment in accordance with labels, MSDS, manufacturer instructions and workplace procedures and regulations
- closely following safe autoclave operating procedures to avoid

- accidents and prevent damage to culture media
- regular cleaning, sterilisation and/or disinfecting of equipment
- prompt clean-up of spills in accordance workplace procedures

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 MSL973003A Prepare culture media

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 MSL973003 Prepare culture media

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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:

- using standard methods to safely prepare at least three (3) different batches of culture media that meet specifications and are free of contamination
- using appropriate sterilisation techniques, including maintaining adequate space between containers to prevent cross-contamination
- performing quality assurance checks on media, including streaking out of cultures to a single colony and lawn cultures
- performing post-sterilisation procedures, including dispensing or adding using aseptic technique
- recognising and reporting non-compliances, anomalies or out-of-specification results
- labelling and storing culture media according to workplace procedures
- accurately recording data and completing workplace documentation
- following workplace procedures for the safe use of hazardous equipment and materials during the preparation of culture media
- following workplace procedures for safe removal of disposable and reusable contaminated materials to relevant areas for disinfection, sterilisation and cleaning or disposal.

Knowledge Evidence

Must provide evidence that demonstrates knowledge of:

- basic microbiological concepts and terminology, including growth rates in culture, and production of gas and haemolysis of red cells in media
- growth requirements of microorganisms and tissue, such as bacteria, fungi, protozoans, viruses and multi-cellular parasites, in terms of their laboratory culture
- purpose, content and features of culture media prepared in job role, and the relationship between the correct preparation of culture media and the optimal growth of organisms or cells
- nature, properties and use of a range of biological media
- relationship between sterile practices, hygiene procedures and the ability to obtain growth free of contamination
- the effect of physical requirements, such as pH and temperature on optimal growth of organisms and cells
- the effect of inappropriate storage on culture media quality and performance
- cleaning and sanitising requirements for equipment and work area

- relevant hazards, such as microorganisms and agents; sharps and broken glassware; sources of heat, such as ovens, burners and autoclaves; fluids under pressure, such as steam; and radiation used for sterilisation
- relevant work health safety (WHS) and environment requirements.

Assessment Conditions

- Judgement 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:
 - MSL943002 Participate in laboratory or field workplace safety
 - MSL973004 Perform aseptic techniques
- Holistic assessment methods include:
 - review of quality assurance results and examination of batches of media prepared by the candidate
 - observation of the candidate preparing and dispensing culture media
 - written and/or oral questioning about culture media preparation methods, typical quality problems, common hazards and safety 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 appropriate reagents and equipment, such as pH meters; balances; stirrers, water baths and hot plates; burners, autoclave and Arnold steamer; measuring cylinders, flasks and glassware; Falcon dishes; Petri dishes; media storage bottles and tissue culture bottles; self-refilling syringes; membrane filtration equipment; automatic agar pourers; labelling equipment; distilled water apparatus; refrigerators; sterilisation equipment and indicators
 - workplace schedules and procedures, MSDS and documented safe work practices.
- 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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