



Australian Government

MSL973015 Prepare culture media

Release: 1

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Modification History

Release	Comments
Release 1	This version was released in <i>MSL Laboratory Operations Training Package Release 2.0</i>. Supersedes and equivalent to MSL973003 Prepare culture media. Changes to performance criteria. Range of conditions removed. Assessment requirements amended.

Application

This unit of competency describes the skills and knowledge 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 applies to laboratory assistants in the biomedical, biological, environmental, food processing and pharmaceutical industry sectors.

No licensing or certification requirements exist at the time of publication. However, regulations and/or external accreditation requirements for laboratory operations exist, so local requirements should be checked. Relevant legislation, industry standards and codes of practice within Australia must also be applied.

Pre-requisite Unit

Nil

Competency Field

Testing

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 |
|---|------------------------------|-----|---|

Elements describe the essential outcomes.		Performance criteria describe the performance needed to demonstrate achievement of the element.	
		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	Check pH of media where pH is critical
		1.5	Dispense media into vessels for sterilisation, leaving room for expansion during heating and cooling
2	Sterilise media	2.1	Load the steriliser in keeping with maximum permitted loads and appropriate positioning of materials
		2.2	Ensure a sterilisation indicator is correctly placed with the load to monitor sterilisation process
		2.3	Operate sterilisation cycle in accordance with manufacturer requirements to achieve sterilisation at the required settings
		2.4	Cool media to the temperature specified in the media formulation procedures
		2.5	Sterilise media and/or media additives using membrane filtration techniques
3	Dispense or aliquote media	3.1	Add labile constituents where necessary, under conditions that will not lead to their denaturation or contamination of media
		3.2	Ensure even mixing of additives and media before dispensing
		3.3	Aseptically dispense media to minimise occurrence of procedural contamination
		3.4	Label media to allow for selection, avoiding areas of the culture vessel required for examination of colony growth
4	Label media	4.1	Date batch media to ensure correct batch rotation
		4.2	Label media to allow for selection, avoiding areas of the culture vessel required for examination of colony growth
		4.3	Maintain records of batches of media

Elements describe the essential outcomes.

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

5	Store and incubate media	5.1	Incubate control plates as a sterility check
		5.2	Store media to maximise shelf life and minimise contamination
6	Perform quality control checks	6.1	Inspect media for any evidence of possible contamination or problems with structure or sterilisation
		6.2	Check useability of selective media by growth of expected organism
		6.3	Check stored stocks at regular intervals for conformance to required standards
7	Maintain work area and equipment to prevent cross-infection and contamination	7.1	Use personal protective equipment (PPE) and safe work practices to ensure personal safety and that of other laboratory personnel
		7.2	Place disposable and reusable items into relevant receptacles
		7.3	Clean and disinfect work area and equipment after use
		7.4	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.

Unit Mapping Information

Equivalent to MSL973003 Prepare culture media, Release 1.

Links

MSL Laboratory Operations Companion Volume Implementation Guide is available from VETNet -

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

Assessment Requirements for MSL973015 Prepare culture media

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Performance Evidence

There must be evidence the candidate has completed the tasks outlined in the elements and performance criteria of this unit, and:

- effectively used standard methods to safely prepare at least 3 different batches of culture media that meet specifications and are free of contamination, including:
 - 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
- effectively operated a pH meter.

Knowledge Evidence

There must be evidence the candidate has 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 cells including microorganisms and tissue cells 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
- cell culture:
 - agars, broths and solutions
 - slopes and deeps
 - common enriched media, differential media and selective media
 - common tissue culture media and transport media
 - labile constituents including blood, hormones or antibiotics

- sterilisation techniques:
 - boiling, high temperature, high pressure steam and autoclaving
 - membrane filtration
 - radiation, gas and/or chemical treatments
- relationship between sterile practices, hygiene procedures and the ability to obtain growth free of contamination
- the effect of physical requirements including pH and temperature on optimal growth of organisms and cells
- the effect of inappropriate storage on culture media quality and performance
- relevant hazards and how to deal with the risks presented:
 - microorganisms and reagents
 - sharps and broken glassware
 - sources of heat including ovens and burners
 - fluids under pressure including steam from autoclaves
 - UV radiation
- awareness of environmental sustainability issues as they relate to the work task
- legal, ethical and work health and safety (WHS) requirements specific to the work task.

Assessment Conditions

Skills must have been demonstrated in the workplace or in a simulated environment that reflects workplace conditions and contingencies. The following conditions must be met for this unit:

- use of suitable facilities, equipment and resources, including:
 - a standard laboratory equipped with appropriate reagents and equipment, including pH meters; balances; stirrers, water baths and hot plates; burners, autoclave; measuring cylinders, flasks and glassware; Petri dishes; media storage bottles; self-refilling syringes; membrane filtration equipment; labelling equipment; distilled water apparatus; refrigerators; sterilisation equipment and indicators
 - workplace schedules and procedures, SDS and documented safe work practices.

Assessors must satisfy the NVR/AQTF mandatory competency requirements for assessors.

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