



Australian Government

FBPFST4004 Perform microbiological procedures in the food industry

Release: 1

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Modification History

Release	Comments
Release 1	This version released with the FBP Food, Beverage and Pharmaceutical Training Package Version 2.0.

Application

This unit of competency describes the skills and knowledge required to perform on-site microbiological procedures in the food industry. It applies to laboratory and senior technical staff, and production managers, who are required to monitor the microbiology of food and food processing operations.

The unit applies to individuals who perform on-site tests required in a food processing enterprise, interpret the results of testing as part of monitoring production processes, and identify the need for certified laboratory testing.

No occupational licensing or certification requirements apply to this unit at the time of publication. However, legislative and regulatory requirements for food processing exist, so local requirements must be checked. All work must comply with Australian food safety standards and relevant codes of practice.

Pre-requisite Unit

Nil

Unit Sector

Food science and technology (FST)

Elements and Performance Criteria

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
1. Prepare for safe microbiological work using aseptic techniques	1.1 Select work area, equipment and instructions for the safe handling of materials that may contain microorganisms 1.2 Wear personal protective apparel

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
	1.3 Select relevant emergency equipment for timely response to microbiological accidents 1.4 Apply correct disinfection procedures to work areas before and after use 1.5 Apply standard precautions when handling biological materials
2. Process microbiological samples and undertake microscopy	2.1 Prepare thin smears of samples and stain 2.2 Prepare liquid films of specimens for direct observation 2.3 Concentrate relevant samples to facilitate microscopy 2.4 Set up stereo and compound microscopes and identify causes of variations in image quality 2.5 Examine dry, wet and stained microbiological specimens 2.6 Clean and store microscopes
3. Apply aseptic techniques correctly to cultivate and isolate microorganisms	3.1 Prepare media for culturing cells 3.2 Perform aseptic transfers of microorganisms to prepared liquid and solid media 3.3 Streak bacteria onto media plates to isolate single colonies using aseptic technique 3.4 Select temperature conditions and gaseous environments suitable for the growth of a range of common microorganisms
4. Estimate the number of microorganisms in food and water samples	4.1 Prepare samples for testing 4.2 Carry out serial dilutions aseptically 4.3 Estimate and record bacterial growth in the sample 4.4 Calculate the bacterial load of the sample and report the results
5. Perform and interpret tests to assist in the identification of common bacterial genera	5.1 Perform tests on pure cultures to assist in the identification of major bacterial groups 5.2 Prepare pure cultures selected from common bacterial genera 5.3 Select and prepare stained specimens to demonstrate features and cellular characteristics of major bacterial groups
6. Apply quality assurance procedures commonly used in a food testing laboratory	6.1 Apply controls used to monitor accuracy and precision of results in a microbiological laboratory 6.2 Perform all tests in accordance with enterprise quality procedures

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
	6.3 Record and report all test data appropriately
7. Interpret the results of laboratory testing and relate to the production plan	7.1 Access laboratory test results 7.2 Analyse laboratory tests to identify allowable variances and critical limits in production 7.3 Make adjustments to recipes or operating procedures to ensure critical limits are complied with 7.4 Establish the need for further certified testing

Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential for performance in this unit of competency but are not explicit in the performance criteria.

Skill	Description
Reading	- Interpret codes of practice, regulations, and standards for food safety and critical limits of common bacterial genera - Interpret procedures and methods for food testing and use of testing equipment
Numeracy	- Record and access laboratory test results, including critical limits and allowable variances for common types of bacteria found in foods - Ensure calibration procedures are adhered to

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
FBPFST4004 Perform microbiological procedures in the food industry	FDFST4004A Perform microbiological procedures in the food industry	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion Volume Implementation Guides are found in VETNet: -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=78b15323-cd38-483e-aad7-1159b570a5c4>

Assessment Requirements for FBPFST4004 Perform microbiological procedures in the food industry

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Performance Evidence

An individual demonstrating competency in this unit must satisfy all of the elements and performance criteria of this unit.

There must be evidence that the individual has safely and effectively performed microbiological procedures in the food industry, including:

- safely and effectively performing a minimum of three different multi-step tests to isolate bacteria
- safely isolating, identifying and cultivating microorganisms
- effectively setting up and using microscope slides and a microscope
- recognising the use of the Gram reaction in the identification of common types of bacteria
- identifying the need for certified laboratory testing
- accurately interpreting the results of tests carried out by a certified laboratory.

Knowledge Evidence

An individual must be able to demonstrate the knowledge required to perform the tasks outlined in the elements and performance criteria of this unit. This includes knowledge of:

- physiological characteristics of animal, plant and microbial cells
- microbiological terminology relevant to role
- use of protective clothing and biological safety cabinets
- aseptic sampling techniques
- disinfection and sterilisation as applied to practical aspects of microbiology
- microbial diversity and growth
- aseptic techniques used to cultivate and isolate microorganisms
- microorganisms of significance in the production and spoilage of foods
- chemical and physical methods available for controlling microbial growth
- methods for sterilisation or control of a given microorganism
- the Gram reaction in the identification of common types of bacteria
- purpose of the food tests conducted

- commonly used rapid test kits and their purpose
- rationale for sample dilution when preparing materials for enumerating organisms and other pure culture work
- forms of bacterial colonies on common media used in bacteriological investigations in the food industry
- impact of temperature conditions and gaseous environments on the growth of a range of common microorganisms
- health and safety in the workplace environmental, and quality assurance procedures commonly used in food testing laboratories.

Assessment Conditions

Assessment of skills must take place under the following conditions:

- physical conditions:
 - skills must be demonstrated in a workplace setting or an environment that accurately represents a food testing laboratory
- resources, equipment and materials:
 - personal protective equipment required to perform on-site microbiological procedures in the food industry
 - common laboratory equipment and a sufficient range of samples to allow microbiological procedures to be demonstrated
- specifications:
 - procedures and templates used to report relevant product and/or process information and recorded results.

Assessors of this unit must satisfy the requirements for assessors in applicable vocational education and training legislation, frameworks and/or standards.

Links

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