



Australian Government

FBPCHE5001 Carry out sampling and interpret tests for cheese production

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 carry out sampling and basic testing, and interpreting the results for artisan cheese production.

This unit applies to individuals employed as production managers who take responsibility for their own work and for the quality of the work of others in an artisan cheese enterprise. They develop and implement procedures, prepare ingredients and maintain product safety and quality throughout production.

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

Prerequisite unit of competency for this unit is:

- MSL973013 Perform basic tests

Unit Sector

Cheese (CHE)

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. Implement sampling procedures in cheese making	1.1 Determine and document sampling points for physical, chemical and microbial properties

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
	1.2 Determine an appropriate sampling size 1.3 Select and sterilise sampling equipment 1.4 Document and implement the sampling plan
2. Monitor chemistry in cheese making	2.1 Record an acidity profile for each stage in the production process 2.2 Carry out tests at stages for indicators, including salt levels, pH, moisture levels and fat levels, according to workplace procedures 2.3 Analyse whey content for fat to gauge efficiency of curd cutting and yield potential 2.4 Establish and review safe work procedures for processes requiring handling of chemicals and involving chemical reactions in cheese making
3. Monitor microbiological changes through the cheese making process	3.1 Prepare samples for testing according to workplace procedures 3.2 Ensure that serial dilutions are carried out aseptically 3.3 Compare stained specimens to reference samples to identify bacterial composition 3.4 Perform tests on cultures to ensure they have adequate activity before inoculating the vat 3.5 Make observations and record data for yeasts and moulds, total coliforms and staphylococci 3.6 Carry out sampling and testing for inhibitory substances in milk 3.7 Sample whey for bacteriophage levels and interpret the results
4. Carry out testing and interpret results to make adjustments to cheese making processes	4.1 Use tactile and visual senses to detect physical and chemical changes during cheese making 4.2 Evaluate organoleptic properties of final cheese product using sensory testing 4.3 Record and interpret tests results for information on composition, properties and reactions 4.4 Document recommended specifications for physical, chemical and microbial properties 4.5 Evaluate yield efficiency by comparing to established process control parameters 4.6 Reference specifications against test data 4.7 Implement changes to cheese making process based on test results

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	Read and interpret technical information to determine food properties and reactions
Numeracy	Interpret test results for yeasts and moulds, coliforms and staphylococci
Get the work done	Use the main features and functions of digital tools to complete computational analysis and recording of results

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
FBPCHE5001 Carry out sampling and interpret tests for cheese production	FDFCH4001A Carry out sampling and interpret tests for cheese production	Updated to meet Standards for Training Packages Unit code updated to reflect AQF level Minor changes to Performance Criteria for clarity	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 FBPCHE5001 Carry out sampling and interpret tests for cheese production

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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 carried out sampling and interpreting tests for cheese production, including:

- interpreting and applying three different sampling plans and procedures, including:
 - in relation to the process chart for a cheese product
 - hard cheeses using a cheese trier or sample shaft
 - liquid cheese homogenate for microbiological analysis
- measuring and altering pH
- interpreting test results for yeasts and moulds, coliforms and staphylococci
- determining and applying methods for the control of growth of microorganisms
- identifying and reviewing safety hazards and control methods required when handling chemicals and working with processes that involve chemical reactions.

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:

- use of technical terms used to communicate information on properties of food and materials commonly used in the food industry
- physical characteristics or phenomena that occur through cheese processing:
 - chemistry (acidity, calcium phosphate and salt levels)
 - microbiological counts
 - handle and feel of the product
 - total solids (or moisture)
 - heat and temperature
 - taste, smell and appearance of the final cheese product
- the processes where characteristics and phenomena can be observed

- processes for the making of different types of cheese
- the processing stages designed to affect the structure of these compounds (e.g. the use of fermentation to coagulate the casein micelles for acid-coagulated cheeses, compared to the use of rennet for rennet-coagulated cheeses)
- common chemical reactions that occur, factors required to cause a reaction, and the effect of reactions for cheese making, including both spontaneous and controlled reactions, such as:
 - oxidation
 - enzymic
 - Maillard
 - acid-based reactions
 - other reactions relevant to a given cheese type and production process
- physical changes that occur to ingredients and product through cheese making
- reactions and properties of carbohydrates, proteins and fats through the cheese making process
- behaviour of each type of matter and its relationship to the production process
- changes in acidity through the cheese making process and its influence on spoilage, moisture and mineral content, texture and flavour
- temperature control and its impact throughout a cheese making process
- acidity profile (either pH or titratable acidity) ranges for the different types of cheeses
- the significance of fermentation for the control of spoilage and pathogens in cheese, and its influence on moisture levels, mineral content, texture and flavour
- the basic molecular structures of carbohydrates, proteins and fats
- the role of enzymes in generating biological reactions (e.g. the use of rennet as a coagulating agent)
- coagulation time and setting time for rennet
- factors that influence syneresis and its importance in cheese making
- types of microbial cells and their components and functions
- the main types of microorganisms and their activity in cheese making, both those that enhance the process and those that impact negatively on cheese characteristics
- types of pathogenic bacteria that can be present in milk and cheese products
- sampling requirements for cheese making
- pH, moisture and salt gradients in brine salted cheese (need for homogeneity in sampling)
- buffering in milk and the role of casein and phosphate levels
- basic molecular structures of carbohydrates, proteins and fats
- disinfection and sterilisation as applied to practical aspects of microbiological diversity and growth
- microorganisms of significance in the production and spoilage of cheese
- raw milk quality tests
- testing methods and interpretation of results for salmonella, staphylococcus, listeria and E. coli in raw milk cheese
- testing methods and interpretation for bacteriophage in whey
- interpreting measurements at stages in a cheese making process covering:

- salt to moisture ratio (S/M)
- moisture in the non-fat substance (MNFS)
- fat in the dry matter (FDM)
- chemical and physical methods available for controlling microbial growth
- health and safety hazards and control methods, and food safety standards relevant to the workplace
- sources of technical information.

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 real workplace
- resources, equipment and materials:
 - production process and related equipment for cheese production
 - sampling and testing equipment
 - a range of cheeses at different stages of production for sampling
 - test results for a range of different cheeses or different stages of production
- specifications:
 - manufacturers' advice and product specifications.

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

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