



**Australian Government**

**Department of Education, Employment and Workplace Relations**

# **FDFCH3002A Carry out processes for a range of artisan cheeses**

**Release: 2**

## **FDFCH3002A Carry out processes for a range of artisan cheeses**

### **Modification History**

April 2012: Minor typographical corrections.

### **Unit Descriptor**

This unit of competency covers the skills and knowledge required to carry out artisan cheese making processes under the direction and supervision of the operations manager.

### **Application of the Unit**

This unit applies to workers in artisan cheese enterprises, which use small scale methods to produce cheeses. The unit typically applies to staff with responsibility for implementing operational procedures, keeping basic records and complying with personal, and food safety and quality standards. This unit includes handling ingredients and cheese throughout production, using cheese making equipment, implementing operational procedures, and reporting variances and issues in production.

### **Licensing/Regulatory Information**

Not applicable.

### **Pre-Requisites**

Not applicable.

### **Employability Skills Information**

This unit contains employability skills.

### **Elements and Performance Criteria Pre-Content**

Elements describe the essential outcomes of a unit of competency.

Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

## Elements and Performance Criteria

| ELEMENT                                                             | PERFORMANCE CRITERIA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
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| 1. Apply sanitation procedures                                      | 1.1 The storage area for starter cultures is kept clean to reduce the risk of infection<br>1.2 All surfaces are kept clean and sanitised, except for curing boards<br>1.3 Stringent personal hygiene procedures are applied<br>1.4 Raw milk area is maintained separate from pasteurised milk operations<br>1.5 Multi-phase cleaning systems are applied to ensure sanitised surfaces and equipment<br>1.6 Food safety related information is recorded, as required, including milk counts and cheese bacterial counts |
| 2. Implement procedures to prepare milk for cheese making           | 2.1 Clarification procedures for raw milk are carried out, if required<br>2.2 Standardisation procedures for milk are implemented to be processed into cheese<br>2.3 Pasteurisation procedures are carried out for milk<br>2.4 Homogenisation procedures are carried out for milk, where required                                                                                                                                                                                                                      |
| 3. Carry out procedures to inoculate milk and cut the curd          | 3.1 Inoculants and adjuncts are added to milk and it is allow to ripen to specification<br>3.2 Rennet is measured accurately and diluted before adding to milk<br>3.3 Temperature is maintained at specified level evenly throughout the vat<br>3.4 Curd samples are taken and tests carried out for acidity (either pH or titratable acidity) and temperature                                                                                                                                                         |
| 4. Implement procedures to separate, cook and wash the curd         | 4.1 Curd cutting is carried out using the correct technique and equipment to minimise loss of protein and fat as fines<br>4.2 Whey fat levels are assessed to monitor curd cutting efficiency<br>4.3 The cooking schedule is followed and curd is stirred to ensure optimal syneresis<br>4.4 Draining and optional washing procedures are carried out to ensure curd is at required moisture, pH level and consistency                                                                                                 |
| 5. Carry out fermentation, salting and optional pressing treatments | 5.1 Curd is transferred to moulds to form the shape of cheeses for brine salted cheeses and then held at a constant temperature for completion of fermentation<br>5.2 Acidification of curd is continued after draining, then dry salt is added to milled curd before pressing<br>5.3 Salting treatments are applied to ensure uniform salt levels in the finished product<br>5.4 Dry salted cheese is pressed in the required moulds                                                                                  |

| <b>ELEMENT</b>                                                                       | <b>PERFORMANCE CRITERIA</b>                                                                                                                                                                                                                                                                                                                                                                                                            |
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| 6. Implement cheese curing and packaging procedures                                  | 6.1 Curing requirements (duration, temperature and humidity, where applicable) for a range of cheeses are applied<br>6.2 The curing environment is monitored<br>6.3 Ripening agents are added to cheese, if required<br>6.4 Packaging and labelling procedures are carried out, either before or after curing, as required                                                                                                             |
| 7. Assess the organoleptic properties of cheese and relate to specifications         | 7.1 Desirable and undesirable flavours in cheese are identified<br>7.2 Different textures of cheeses are recognised<br>7.3 Cheese is assessed for evenness of colour and finish<br>7.4 Possible causal factors are identified and changes made to procedures to address cheese quality issues                                                                                                                                          |
| 8. Meet workplace requirements for food safety, quality and environmental management | 8.1 Records of cheese manufacture are kept, including required measurements for timing of operations, temperature, milk and curd acidity, curd weight, hooped yield and curing data<br>8.2 Health and safety and environmental protection procedures are implemented for the cheese making working environment<br>8.3 Waste is disposed of and contribution made to the review of environmental impacts of the cheese making operation |

## Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

### Required skills include:

#### Ability to:

- carry out cleaning and sanitation procedures
- follow a process flow chart for cheese making showing inputs, processes and outputs
- prepare milk for cheese making
- carry out homogenisation and standardisation procedures, where required
- apply heat treatment to milk and monitor temperature
- add starter to initiate fermentation process and optional adjunct cultures for desirable attributes in different cheese types
- measure and mix rennet to promote coagulation
- carry out curd cutting
- carry out cooking and drainage operations
- apply procedures to promote syneresis
- separate whey from curd and press and salt curd
- monitor storage and ripening, if applicable, conditions for cheese
- carry out sampling for chemical and microbiological testing of cheese
- assess cheese for organoleptic qualities
- conduct tests for pH, moisture and salt levels in cheese
- carry out packaging of cheese
- implement safe work practices
- comply with environmental requirements for a processing operation.

### Required knowledge includes:

#### Knowledge of:

- the main cheese types and the common processes for making different types of cheeses
- the main components of milk and cheese (both curds and whey)
- purpose and basic principles of cheese making
- quality characteristics to be achieved by each cheese making process
- milk characteristics and components important in cheese making
- milk preparation for cheese making (standardisation, pasteurisation and homogenisation)
- types of starters used and their role in the fermentation process
- effect of milk characteristics on cheese processing performance
- moisture control in cheese making
- processes of coagulation and syneresis and their role in cheese making
- effects of acidity (either pH or titratable acidity) and temperature on cheese processing performance and product quality
- types and impact of inhibitory substances in milk
- microbial contaminants of cheese (lipolytic bacteria, yeasts, moulds, bacillus, listeria, E.

- coli, salmonella, coliforms and staphylococci) and their impact on cheese quality
- the impact of bacteriophage in fermentation and ripening
- sampling and testing procedures for microbes
- role of yeasts, moulds and adjunct cultures in cheese making
- temperature and humidity of curing
- ripening agents for different cheese types
- contamination/food safety risks associated with the process and related control measures
- techniques used to monitor the cheese making process, including inspecting, measuring and testing, as required by the process
- common causes of variation and corrective action required for each cheese making process
- organoleptic properties and their relationship to processes and ingredients in cheese making
- sampling procedures
- food safety and quality assurance standards and procedures
- hygiene, cleaning and sanitation procedures in line with best manufacturing practice
- routine maintenance procedures
- product/batch changeover procedures
- occupational health and safety (OHS) hazards and controls
- contamination risk of inoculants and contaminants
- food safety principles and procedures
- Food Standards Code
- procedures and responsibility for reporting production and performance information
- environmental issues and controls, including waste collection and handling procedures

## Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

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| <b>Overview of assessment</b>                                                                       | A person who demonstrates competency in this unit must be able to carry out artisan cheese making processes under the direction and supervision of the operations manager.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Critical aspects for assessment and evidence required to demonstrate competency in this unit</b> | <p>Critical aspects of assessment must include evidence of the ability to carry out processes in artisan cheese making, including:</p> <ul style="list-style-type: none"> <li>• following procedures for sanitation, food safety, quality assurance and environmental management in artisan cheese production</li> <li>• carrying out operations to: <ul style="list-style-type: none"> <li>• prepare milk for cheese making</li> <li>• coagulate milk through inoculation and ripening</li> <li>• separate and wash curd</li> <li>• carry out cooking and curing processes</li> <li>• package and label artisan cheeses according to procedures.</li> </ul> </li> </ul>                                                                                                                                                                                                                                         |
| <b>Context of and specific resources for assessment</b>                                             | <p>Assessment of performance requirements in this unit should be undertaken within the context of food cheese production. Competency is demonstrated by performance of all stated criteria, including the critical aspects and knowledge and skills elaborated in the Evidence Guide, and within the scope as defined by the Range Statements applicable to the workplace environment.</p> <p>Assessment must occur in a real or simulated workplace where the assessee has access to:</p> <ul style="list-style-type: none"> <li>• production process and related equipment, manufacturers' advice and operating procedures</li> <li>• sampling and testing equipment and procedures</li> <li>• methods and related software systems, as required, for collecting data and calculating yields, efficiencies and material variances appropriate to the type of cheese and the production environment.</li> </ul> |
| <b>Method of assessment</b>                                                                         | <p>The following assessment methods are suggested:</p> <ul style="list-style-type: none"> <li>• observation of candidate conducting cheese making processes as per operational procedures, including the appropriate sampling and testing</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

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|                                            | <ul style="list-style-type: none"><li>• written and/or oral questioning to assess knowledge and understanding</li><li>• third-party supporting statement.</li></ul>                                         |
| <b>Guidance information for assessment</b> | Evidence should be gathered over a period of time, should cover all stages of cheese making, and should be assessed for a range of cheese types. Cheese can be produced in a real or simulated environment. |

## Range Statement

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| <p>The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.</p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Legislation</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <p>Legislative requirements are typically reflected in procedures and specifications. Legislation relevant to this industry includes:</p> <ul style="list-style-type: none"> <li>the Food Standards Code, including labelling, weights and measures legislation</li> <li>legislation covering food safety, environmental management, OHS, anti-discrimination and equal opportunity.</li> </ul>                                                                                                                                                                                                           |
| <b>Policies and procedures</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <p>Work is carried out according to:</p> <ul style="list-style-type: none"> <li>company procedures</li> <li>regulatory and licensing requirements</li> <li>legislative requirements</li> <li>industrial awards and agreements.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Safe work practices</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <p>Safe work practices are determined by risk assessment on site and may cover:</p> <ul style="list-style-type: none"> <li>use of personal protective equipment (PPE)</li> <li>manual handling procedures</li> <li>exposure to hazardous substances</li> <li>hazards in the processing environment, such as noise, moving equipment, scalds, and trips and falls.</li> </ul>                                                                                                                                                                                                                              |
| <b>Artisan production systems</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <p>Artisan production involves the making of cheese by traditional (non-industrial) methods. Emphasis is placed on observing and handling the cheese during processing. Artisan producers typically employ less than 30 people and do comparatively small production runs of specialty type cheeses.</p> <p>Industrial production relies on mechanised equipment to perform a number of processing stages in the one machine. Production runs and output are of higher volume than artisan production. Industrial production can also include specialty cheeses if mechanised equipment is available.</p> |
| <b>Cheese types</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <p>Cheese types include any type of fermented cheese product, including</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

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|                               | <ul style="list-style-type: none"> <li>• acid-coagulated (e.g. Cottage and cream cheese)</li> <li>• acid/heat-coagulated (e.g. Ricotta)</li> <li>• rennet-coagulated (e.g. Cheddar, Parmesan, Gouda, Swiss and Camembert).</li> </ul>                                                                                                                                                                                 |
| <b>Cheese inoculants</b>      | <p>Cheese inoculants include:</p> <ul style="list-style-type: none"> <li>• the lactic acid bacteria which are added to the milk as a culture in inoculation</li> <li>• fungi.</li> </ul>                                                                                                                                                                                                                              |
| <b>Cheese additives</b>       | <p>Cheese additives may be added to the milk after inoculation and include</p> <ul style="list-style-type: none"> <li>• calcium chloride</li> <li>• nitrates</li> <li>• colour</li> <li>• lipases.</li> </ul>                                                                                                                                                                                                         |
| <b>Cheese adjuncts</b>        | <p>Cheese adjuncts are microbial populations added to cheese in addition to the normal inoculants to:</p> <ul style="list-style-type: none"> <li>• provide consistency to flavour and texture</li> <li>• accelerate flavour development</li> <li>• produce specific attributes to meet market targets.</li> </ul>                                                                                                     |
| <b>Cheese tests</b>           | <p>Cheese tests may include:</p> <ul style="list-style-type: none"> <li>• testing for pH levels, moisture levels and salt levels</li> <li>• physical testing of cheese throughout production</li> <li>• testing for organoleptic properties.</li> </ul>                                                                                                                                                               |
| <b>Homogenising equipment</b> | <p>Homogenising equipment typically includes:</p> <ul style="list-style-type: none"> <li>• a supply pump</li> <li>• homogeniser block</li> <li>• homogenising valve</li> <li>• pressure gauge</li> <li>• back-pressure valve</li> <li>• pressure relief valve</li> <li>• pressure, micro-gap, centrifugal and ultrasonic homogenisers</li> <li>• related equipment, such as:</li> <li>• a deaeration unit.</li> </ul> |
| <b>Pasteurisation methods</b> | <p>Pasteurisation methods may be:</p> <ul style="list-style-type: none"> <li>• batch or continuous. For hard cheeses matured more than three months at no less than 2°C, heat treatment of milk (lower temperature for the same time) may be used.</li> </ul>                                                                                                                                                         |

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| <b>Pasteurisation equipment</b>        | <p>Pasteurisation equipment includes:</p> <ul style="list-style-type: none"> <li>• thermometers</li> <li>• recorder/controllers</li> <li>• flow diversion devices</li> <li>• pumps</li> <li>• heat exchangers</li> <li>• holding and cooling stages</li> <li>• filters and clarifiers</li> <li>• vacuum breakers</li> <li>• direct steam injection equipment.</li> </ul> |
| <b>Curd cutting</b>                    | <p>Curd cutting may be:</p> <ul style="list-style-type: none"> <li>• manual with cutting harps</li> <li>• automated with mechanical knives.</li> </ul>                                                                                                                                                                                                                   |
| <b>Cheese pressing</b>                 | <p>Cheese pressing may include:</p> <ul style="list-style-type: none"> <li>• pressing the cheeses to the required pressure to form the shape.</li> </ul>                                                                                                                                                                                                                 |
| <b>Salting methods</b>                 | <p>Salting methods may be by:</p> <ul style="list-style-type: none"> <li>• either brine salting or vat salting methods and may be carried out before or after pressing, depending on the type of cheese.</li> </ul>                                                                                                                                                      |
| <b>Packaging methods</b>               | <p>Packaging methods may include:</p> <ul style="list-style-type: none"> <li>• vacuum packaging in plastic, laminated foil, wax surfacing or wrapping in cloth.</li> </ul>                                                                                                                                                                                               |
| <b>Multi-phase cleaning systems</b>    | <p>Multi-phase cleaning systems may include:</p> <ul style="list-style-type: none"> <li>• cleaning with a chlorinated alkaline detergent with a chelator, followed by water and acid rinses.</li> </ul>                                                                                                                                                                  |
| <b>Food safety related information</b> | <p>Food safety related information may include:</p> <ul style="list-style-type: none"> <li>• milk counts</li> <li>• cheese bacterial counts</li> <li>• manufacture and storage details.</li> </ul>                                                                                                                                                                       |
| <b>Cleaning standards</b>              | <p>Cleaning standards include:</p> <ul style="list-style-type: none"> <li>• AS 4709 - 2001 Guide to cleaning and sanitising of plant and equipment in the food industry</li> <li>• AS 1162 - 2000 Cleaning and sanitising dairy factory equipment</li> <li>• AS 2541 - 1998 Guide to the cleaning-in-place of dairy factory equipment.</li> </ul>                        |

## **Unit Sector(s)**

Cheese.