



**Australian Government**

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

# **FDFOP2067A Operate a brewery fermentation process**

**Release: 1**

## **FDFOP2067A Operate a brewery fermentation process**

### **Modification History**

New Unit.

### **Unit Descriptor**

This unit covers the preparation for and operation of processes used to ferment wort into beer. This includes pitching, fermentation control, yeast propagation and storage, and beer recovery.

### **Application of the Unit**

This unit applies to operators and other personnel responsible for operating the fermentation process in a brewery. The unit applies to fermentation processes in both large and small breweries. Work is undertaken to specifications and requirements developed by brewers, supervisors or other qualified personnel. The unit includes complying with quality and standard operating procedures and conducting of routine changeovers.

### **Licensing/Regulatory Information**

Not applicable.

### **Pre-Requisites**

FDFOP2071A Identify key stages and beer production equipment in a brewery

### **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
1 Prepare the fermentation process for operation	1.1 Production requirements are checked 1.2 Availability of required materials is confirmed 1.3 Availability of services is confirmed 1.4 Pre-operational checks of equipment are conducted including checking that hygiene and sanitation standards are met and all safety guards are in place 1.5 The fermentation process is set to meet production requirements
2 Operate and monitor the system	2.1 The system is started up according to specified procedures 2.2 Control points are monitored to confirm performance is maintained within specification 2.3 System and sub-system outputs meet specification 2.4 Equipment is monitored to confirm operating condition 2.5 Temperature is monitored and controlled to confirm operating condition 2.6 Pressure is monitored and controlled in order to ensure operating condition 2.7 Analysis is undertaken to ensure yeast effectiveness and freedom from bacterial contamination
3 Recover beer if required	3.1 Yeast slurry is put through a beer recovery process in order to minimise beer wastage 3.2 Recovered beer is routed to appropriate tank or vessel
4 Shut down the system	4.1 The system is shut down according to company procedures 4.2 Equipment is cleaned and maintained to meet the cleaning schedule and procedural requirements 4.3 Waste generated by both the process and cleaning procedures is collected, treated and disposed of or recycled according to company procedures
5 Contribute to continuous improvement of the system	5.1 Quality or process outputs are assessed against specifications 5.2 Opportunities for improvement are identified and investigated 5.3 Proposals for improvements are developed and implemented within company planning arrangements and according to company procedures
6 Record information	6.1 Workplace information is recorded in the appropriate format

## Required Skills and Knowledge

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

### Required skills include:

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#### Ability to:

- pitch and crop yeast
- operate vessel transfer equipment
- handle dangerous goods according to procedures
- methods of monitoring control points within the fermentation process
- undertake corrective action required in the event of variation to specifications and operating parameters
- identify OHS hazards and implement appropriate action
- shutdown process and equipment and implement cleaning requirements associated with changeovers
- handle waste according to requirements and procedures
- clean and sanitise equipment according to enterprise procedures
- select, fit and use personal protective clothing and equipment
- maintain work area to meet housekeeping standards
- use oral communication skills/language competence to fulfil the job role as specified by the organisation, including questioning, active listening, asking for clarification and seeking advice from supervisor
- work cooperatively within a culturally diverse workforce

### Required knowledge includes:

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#### Knowledge of:

- purpose and principles of the fermentation process
- relationship between the fermentation process, the wort production process and the maturation process
- stages and changes which occur during fermentation
- requirements of fermentation
- quality characteristics to be achieved
- process specifications, procedures and operating parameters
- significance of control points within the fermentation process
- equipment and instrumentation components, purpose and operation
- vessel cooling systems
- common causes of variation and corrective action required
- OHS hazards and controls
- procedures and responsibilities for reporting problems
- environmental issues and controls
- shutdown and cleaning requirements associated with changeovers and types of shutdowns
- waste handling requirements and procedures

- recording requirements and procedures
- cleaning and sanitation procedures
- sampling and testing procedures
- routine maintenance 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.

Overview of assessment	Assessment must be carried out in a manner that recognises the cultural and literacy requirements of the assessee and is appropriate to the work performed. Competence in this unit must be achieved in accordance with food safety standards and regulations.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>Evidence of ability to:</p> <ul style="list-style-type: none"> <li>• access workplace information to identify production requirements and schedules including type of beer being produced</li> <li>• confirm the supply of necessary materials and services to the fermentation process</li> <li>• confirm equipment status and condition</li> <li>• set up and start the process</li> <li>• propagate yeast (laboratory staff will usually undertake initial propagation)               <ul style="list-style-type: none"> <li>• adding oxygen based upon instruction</li> <li>• monitoring temperature</li> </ul> </li> <li>• crop yeast for addition to wort</li> <li>• monitor supply and flow of materials to and from the process</li> <li>• add adjuncts as required</li> <li>• take corrective action in response to out-of-specification results or non-compliance and report and/or record corrective action as required</li> <li>• aerate wort/beer to encourage fermentation</li> <li>• conduct product/beer-type changeovers</li> <li>• prepare equipment for cleaning</li> <li>• conduct routine maintenance</li> <li>• operate a beer recovery procedure.</li> </ul>
Context of and specific resources for assessment	<p>Assessment must occur in a real or simulated workplace where the assessee has access to:</p> <ul style="list-style-type: none"> <li>• standard operating procedures and related advice on specific safe work practices, company policies and codes of practice relating to OHS</li> <li>• advice on relevant legislation and codes of practice relating to OHS</li> <li>• personal protective clothing and equipment as</li> </ul>

	<p>required</p> <ul style="list-style-type: none"><li>• relevant hazard control equipment</li><li>• manual handling equipment as required</li><li>• fermentation process equipment</li><li>• fermentation raw material and other ingredients</li><li>• information systems and procedures.</li></ul>
Method of assessment	<p>This unit should be assessed together with core units and other units of competency relevant to the function or work role. Examples could be:</p> <ul style="list-style-type: none"><li>• FDFOP2003A Clean equipment in place</li><li>• FDFOP2004A Clean and sanitise equipment</li><li>• FDFOP2011A Conduct routine maintenance</li><li>• FDFOP2013A Apply sampling procedures</li><li>• FDFOP2030A Operate a process control interface</li><li>• MSL973001A Perform basic tests.</li></ul>
Guidance information for assessment	<p>To ensure consistency in one's performance, competency should be demonstrated on more than one occasion over a period of time in order to cover a variety of circumstances, cases and responsibilities, and where possible, over a number of assessment activities.</p>

## Range Statement

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.

<b>Fermentation process</b>	<p>The fermentation process may include:</p> <ul style="list-style-type: none"> <li>• receiving wort</li> <li>• pitching</li> <li>• monitoring and adjusting pressure and temperature</li> <li>• yeast handling and removal</li> <li>• transfer of the beer to maturation.</li> </ul>
<b>Services</b>	<p>May include:</p> <ul style="list-style-type: none"> <li>• power</li> <li>• gas</li> <li>• water</li> <li>• steam</li> <li>• compressed air</li> <li>• refrigeration.</li> </ul>
<b>Equipment</b>	<p>Equipment may include:</p> <ul style="list-style-type: none"> <li>• pumps</li> <li>• fermentation vessels</li> <li>• recovery vessels</li> <li>• separators</li> <li>• cleaning equipment</li> <li>• equipment accessories</li> <li>• valves</li> <li>• vacuum relief systems</li> <li>• aeration equipment</li> <li>• transfer systems</li> <li>• propagation vessels.</li> </ul> <p>Process equipment and operation and monitoring functions may be manual or involve the use of a process control system</p>
<b>Monitor the fermentation process and system may include:</b>	<p>Monitoring may include:</p> <ul style="list-style-type: none"> <li>• use of production data such as performance control charts</li> <li>• monitor for out-of-specification results or noncompliance. These may include:</li> </ul>



	<ul style="list-style-type: none"><li>• oxygen</li><li>• carbon dioxide</li><li>• gravity</li><li>• acidity</li><li>• colour</li><li>• bitterness</li><li>• bacteria</li><li>• chemicals</li><li>• temperature</li></ul>
<b>Control points refer:</b>	<ul style="list-style-type: none"><li>• to those key points in a work process which must be monitored and controlled. This includes food safety (critical) quality and regulatory control points as well as inspection points.</li></ul>
<b>Workplace information may include:</b>	<ul style="list-style-type: none"><li>• Standard Operating Procedures (SOPs); specifications and production schedules</li><li>• Information systems may be print or screen based.</li></ul>

## Unit Sector(s)

Operations.